

**U.S. Department of the Interior
Bureau of Land Management
White River Field Office
73544 Hwy 64
Meeker, CO 81641**

LAND HEALTH ASSESSMENT

NUMBER: CO-110-2006-055-EA

LOCATION: Wolf Creek Watershed-Three Springs Ranch (0501447)

SUMMARY:

STANDARDS FOR PUBLIC LAND HEALTH: In January 1997, Colorado Bureau of Land Management (BLM) approved the Standards for Public Land Health. These standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. These findings are located in specific elements listed below:

STANDARDS FOR PUBLIC LAND HEALTH			
	Current Situation		
Standard	Acres / % Achieving or Moving Towards Achieving	Acres Not Achieving	Causative Factors
#1-Upland Soils			
Wolf Ck. 06323	52955 acres / 97.6%	1295	Historical grazing practices, cattle use near water, feeding practices, excessive erosion. (Altered ground cover -cheatgrass etc.)
Hall Draw 06335	6402 acres / 91.8%	575	Historical grazing practices, drought, excessive erosion. (Altered ground cover –cheatgrass, headcuts)
Massadona 06324	7685 acres / 91.4%	720	Historical grazing practices, lowland drainages w/ cheatgrass, historical feeding practices, use near water, excessive erosion. (Altered ground cover –cheatgrass, headcuts)
Horse Draw 06332	11223 acres / 89.3%	1343	Historical grazing practices, lowland drainages w/ cheatgrass, trailing use (Victory Trail), use near water, excessive erosion. (Altered ground cover –cheatgrass, headcuts)
#2-Riparian Systems			
Wolf Ck. 06323	3.4 miles / 79.1%	0.9 miles	Flood event, grazing practices, small headcuts.
Hall Draw 06335	N/A	N/A	N/A
Massadona 06324	1.4 miles/100%	0	N/A

STANDARDS FOR PUBLIC LAND HEALTH			
Standard	Current Situation		
	Acres / % Achieving or Moving Towards Achieving	Acres Not Achieving	Causative Factors
Horse Draw 06332	7miles / 100%	0	N/A
#3-Plant Communities			
Wolf Ck. 06323	52955 acres / 97.6%	1295	Historical grazing practices, cattle use near water, feeding practices (Undesirable plant communities, cheatgrass etc.)
Hall Draw 06335	6402 acres / 91.8%	575	Historical grazing practices, drought. (Cheatgrass dominance)
Massadona 06324	7685 acres / 91.4%	720	Historical grazing practices, lowland drainages w/ cheatgrass, historical feeding practices, use near water. (Cheatgrass dominance)
Horse Draw 06332	11223 acres / 89.3%	1343	Historical grazing practices, lowland drainages w/ cheatgrass, trailing use (Victory Trail), use near water. (Cheatgrass dominance)
#3-Animal Communities			
Wolf Ck. 06323	52955 acres / 97.6%	1295	Same factors as above
Hall Draw 06335	6402 acres / 91.8%	575	dto
Massadona 06324	7685 acres / 91.4%	720	dto
Horse Draw 06332	11223 acres / 89.3%	1343	dto
#4-Special Status, T&E Species			
Wolf Ck. 06323	52955 acres / 100%	0	There is no evidence to suggest that the distribution and abundance of white-tailed prairie dogs, as keystone to the project area's special status animal populations, are adversely influenced by annual-dominated understories.
Massadona 06324	7685 acres / 100 %	0	dto
Horse Draw 06332	11223 acres / 100 %	0	dto
Hall Draw 06335	6402 acres / 100%	0	Livestock grazing has no influence on riverine habitats associated with bald eagle nest or roost substrate
#5-Water Quality (stream miles)			
Wolf Ck. 06323	27.2 miles / 100%	0	N/A
Hall Draw 06335	12.6 miles / 100%	0	N/A
Massadona 06324	10.2 miles / 100%	0	N/A
Horse Draw 06332	24.2 miles / 70.8%	10	Soil Characteristics, Historical grazing practices. (Cheatgrass dominance)

Issues of Concern:

Standard 1: Roughly 95% of BLM administered lands within the assessment area are meeting or moving towards meeting Public Land Health Standards for Upland Soils (refer to Methods, pp. 57). However, much of the lower Wolf Creek watershed (south of Hwy. 40) occurs upon shale badland soils derived from Mancos Shale. These soils are highly erosive in nature and have extremely high salt/clay content. Reduced vegetal cover in the uplands has further exposed soils to erosional processes. Active head-cutting is common within the assessment area, and soil

pedestaling around vegetation root structures is widespread in the uplands (refer to Standard 1: *Specific Problems*, and *Causative Factors*, pp. 59) .

Standard 2: Of the identified 12.7 stream miles supporting riparian communities, 11.8 miles (93%) are meeting or moving towards achieving Public Land Health Standards for Riparian Systems (refer to Methods, pp. 57). However, weed infestations have been documented within all of the assessed riparian communities. In addition, preferred riparian vegetation such as willows, sedges, and rushes have been impacted by livestock and wildlife grazing. Furthermore, some riparian communities are entirely dependent on water flowing from private water sources (refer to Standard 2: *Specific Problems*, and *Causative Factors*, pp. 62).

Standard 3: Roughly 95% of BLM administered lands within the assessment area are meeting or moving towards achieving Public Land Health Standard #3 (refer to Methods, pp. 57). The remaining 5% of public lands within the assessment area have been identified as early seral communities which do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production (refer to Standard 3: *Specific Problems*, and *Causative Factors*, pp. 63-64). However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock/wildlife grazing.

Standard 4: No major problems involving T&E animal species currently exist. All public lands (100%) within the assessment area are currently meeting Public Land Health Standard #4. However, the intensity of grazing and the number of AUM's currently allowed within the assessment area may adversely impact the vigor, and reproductive ability of BLM sensitive plant species Debris Milkvetch.

Standard 5: Approximately 74.2 miles of stream (88% of all stream miles) within the assessment area are meeting or moving towards achieving Public Land Health Standards for Upland Watersheds. However, nearly all the lower Wolf Creek watershed (south of Hwy. 40) occurs upon shale badland soils that are derived from Mancos Shale (high salt/clay content). In addition, reduced vegetal cover in the uplands has resulted in increased surface runoff and soil erosion. As a result, sediment yield from the assessment area is generally high. The White River ROD/RMP has identified approximately 10 miles (12% of all stream miles within the assessment area) of Wolf Creek below highway 40 (Horse Draw Allotment) as not meeting Public Land Health Standard #5 for suspended sediment and salinity (refer to Standard 5: *Specific Problems*, and *Causative Factors*, pp. 62; Standard 5: Recommendations, pp.68-69). In addition, both Red Wash and Wolf Creek are listed on the states Monitoring and Evaluation List (M&E List) for suspended sediment and salinity impairments.

Recommendations:

- Implementation of the 2005 proposed grazing management (shortened season of livestock use and pasture rest/rotation) plan will enhance the ability of the rangelands to meet and continue to meet Public Land Health Standards.

- Weed treatment in infested riparian areas will aid Functional at Risk (FAR) reaches in attaining Proper Functioning Conditions (PFC).
- Install and maintain fences around existing spring developments/reservoirs source areas to reduce degradation to riparian communities and associated channel morphology at those locations.
- Carryout cheatgrass treatments within the assessment area to increase rangeland productivity, stabilize soils, and reduce sedimentation to lower reaches in the watersheds (2007 BPS project).
- Continue seeding prescribed/natural fires with a preferred seed mixture to increase forage for wildlife/livestock, improve soil stability, and reduce sediment loads to the White and Yampa Rivers.
- Continue to stabilize active head-cutting within the assessment area with vegetation treatments, pit reservoir construction (when necessary), and bank stabilization.
- Improve maintenance on existing roads and discourage travel on all non designated routes in attempts to restore/preserve natural drainage patterns.
- Continue to maintain existing pit reservoirs and gully plugs within the assessment area.

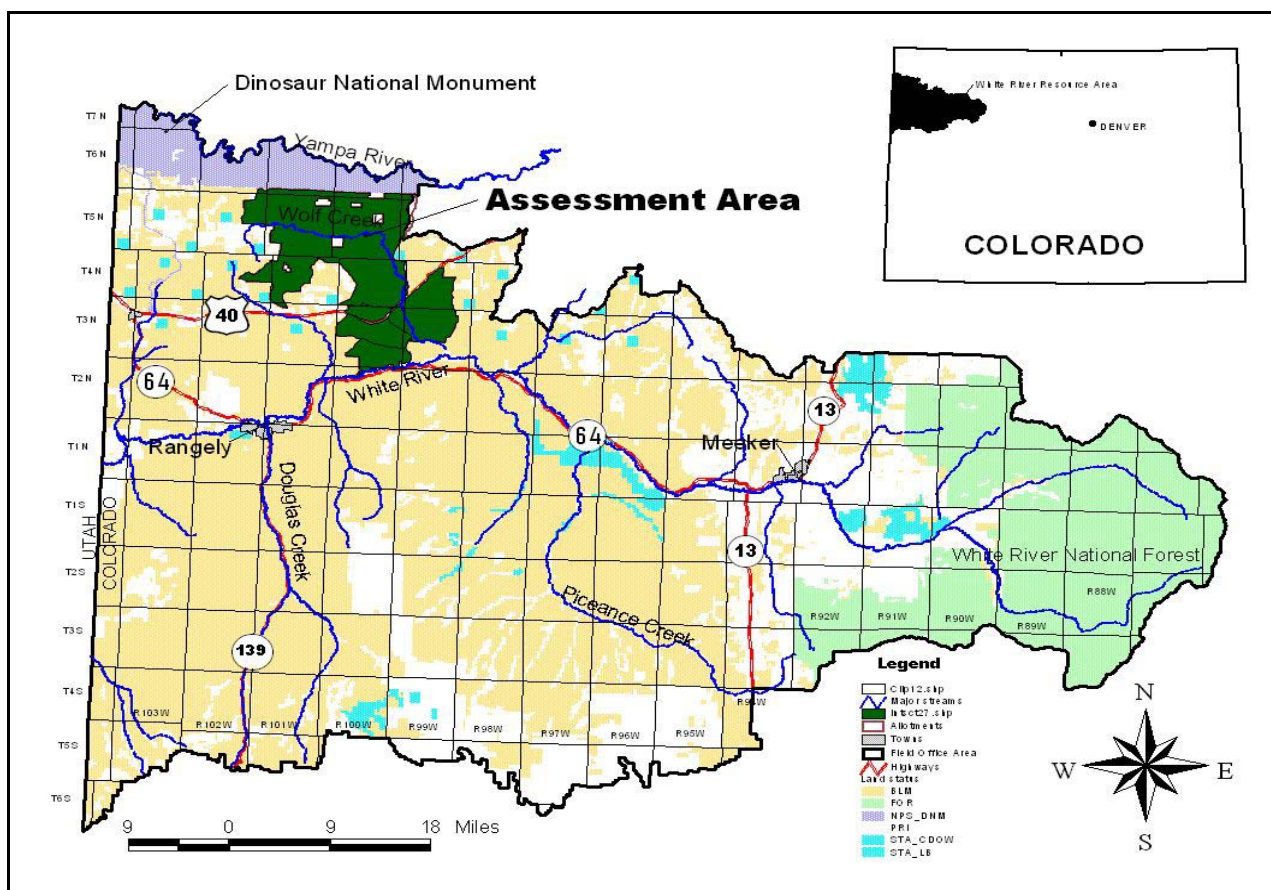
TABLE OF CONTENTS:

Introduction and Background:	6-12
Soils:	12-22
Geology:	23-27
Riparian:	27-31
Vegetation:	31-39
Invasive, Non Native Species:	39-40
Threatened, Endangered, and Sensitive Plant Species:	40
Threatened, Endangered, and Sensitive Animal Species:	40-42
Migratory Birds:	42-43
Wildlife, Terrestrial:	44-44
Water Quality/ Hydrology and Water Rights:	44-57
Methods:	57-58
Results:	58-67
Recommendations:	67-69
Interdisciplinary Review:	70
References:	71
Signature Page:	72

INTRODUCTION AND BACKGROUND:

The assessment area is defined by the allotment boundaries of the recent grazing permit renewal for the Three Springs Ranch (0501447) located within the White River Field Office area (WRFO) in Moffat and Rio Blanco Counties (figure 1). The assessment area is bordered to the north by Dinosaur National Monument, to the south by the White River, to the east by the WRFO boundary and adjoining allotment boundaries, and to the west also by adjoining allotment boundaries.

Figure 1: Location map of the assessment area.



The assessment area encompasses 107,831 total acres and 82,198 acres of BLM lands. The following table gives legal descriptions by allotment within the assessment area.

LEGAL DESCRIPTION:

Allotment		BLM Acres	Legal Description		
No:	Name		Township	Range	Section(s)/Lots or Portions Of:
06323	Wolf Creek	54,250	3N	101W	5, 6
			4N	99W	19, 30
			4N	100W	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36

Allotment		BLM Acres	Legal Description		
No:	Name		Township	Range	Section(s)/Lots or Portions Of:
			4N	101W	7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32
			4N	102W	12, 13, 14, 22, 23, 24, 25
			5N	99W	5, 6, 7, 8, 17, 18, 19, 30
			5N	100W	1-36
			5N	101W	1-36
			5N	102W	1, 2, 3, 10, 11, 12, 13, 14, 15, 23, 24, 25
06324	Massadon a	8,405	3N	99W	18, 19
			4N	100W	33
			3N	100W	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 22, 23, 24
06332	Horse Draw	12,566	3N	99W	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 21, 22, 30, 31
			4N	99W	9, 10, 14, 15, 16, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35
			4N	100W	36
			3N	100W	1, 12
06335	Hall Draw	6,977	2N	100W	2, 3, 4
			3N	100W	21, 25, 26, 27, 28, 29, 33, 34, 35, 36
Total:		82,198			

The table below, accompanying pie graph (figure 2), and map (figure 3) show acreage breakdowns (controlled acres) by land status of allotments permitted to Three Springs Ranch. Figure 4 breaks down the assessment area by pasture.

Acres Breakdown for Three Springs Ranch (Wolf Creek Allotment)							
Pastures of the Wolf Ck Allotment	BLM Acres	% BLM Acres	State Acres	% State Acres	Pvt Acres	% Pvt. Acres	Total Acres
Wolf Creek (1)	8078.00	84.57	332.80	3.48	1141.60	11.95	9552.30
Disappointment Draw (2)	8775.50	89.32	210.90	2.15	838.30	8.53	9824.80
Bear Valley (3)	4791.80	42.95	441.80	3.96	5922.30	53.09	11155.90
Lower Sandhills (4)	7859.40	87.19	584.90	6.49	569.30	6.32	9013.60
Ruppe / Upper Ruppe (5, 15)	1088.30	36.68	0.00	0.00	1878.90	63.32	2967.20
Jack Spring (6)	1954.80	45.01	274.50	6.32	2114.00	48.67	4343.40
Upper Sandhills (7)	1273.50	77.67	365.40	22.28	0.80	0.05	1639.70
Luxen (8, 12)	1808.70	61.71	2.10	0.07	1120.30	38.22	2931.10
Skull Creek (9)	8262.70	92.78	642.90	7.22	0.00	0.00	8905.70
Mud Spring(10)	5344.80	74.76	637.10	8.91	1167.60	16.33	7149.40
Johnson Draw (11)	4596.20	73.09	0.00	0.00	1692.20	26.91	6288.40
Chain Cow (13, Pvt. Pasture)	0.00	0.00	N/A	0.00	N/A	0.00	N/A
Bull Pasture (14)	202.00	10.00	6.80	0.34	1811.30	89.66	2020.10
Three Springs (16)	170.60	37.92	0.00	0.00	279.30	62.08	449.90
Peterson Draw (17)	43.40	10.17	0.00	0.00	383.50	89.83	426.90
Totals:	54249.70	70.76	3499.20	4.56	18919.40	24.68	76668.50
Acres Breakdown for other Three Springs Ranch Allotments							
Hall Draw Allotment	6977.20	100.00	0.00	0.00	0.00	0.00	6977.20
Horse Draw	12566.30	93.40	887.80	6.60	0.00	0.00	13454.10

Acres Breakdown for Three Springs Ranch (Wolf Creek Allotment)							
Pastures of the Wolf Ck Allotment	BLM Acres	% BLM Acres	State Acres	% State Acres	Pvt Acres	% Pvt. Acres	Total Acres
Allotment							
Massadona Allotment	8405.50	78.33	638.20	5.95	1688.50	15.73	10731.20
Totals:	27949.00	89.69	1526.00	4.90	1688.50	5.42	31162.50
Assessment Totals:	82198.70	76.23	5025.20	4.66	20607.90	19.11	107831.00

Figure 2: Land status within the assessment area

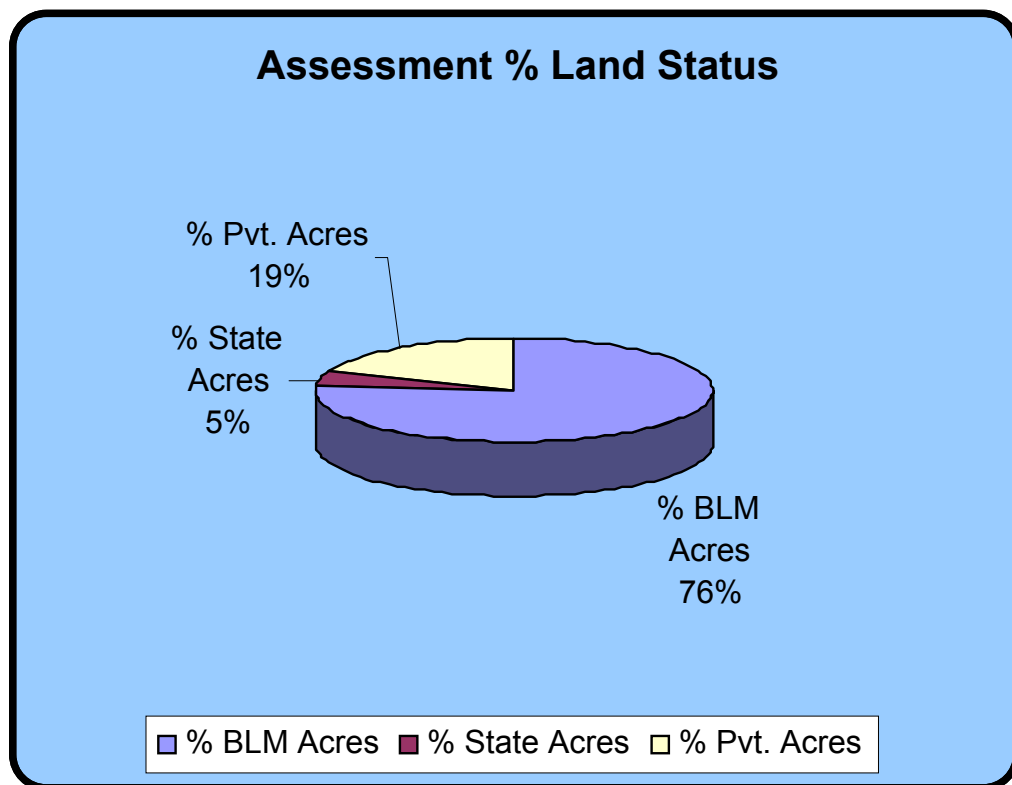


Figure 3: Surface ownership within the assessment area.

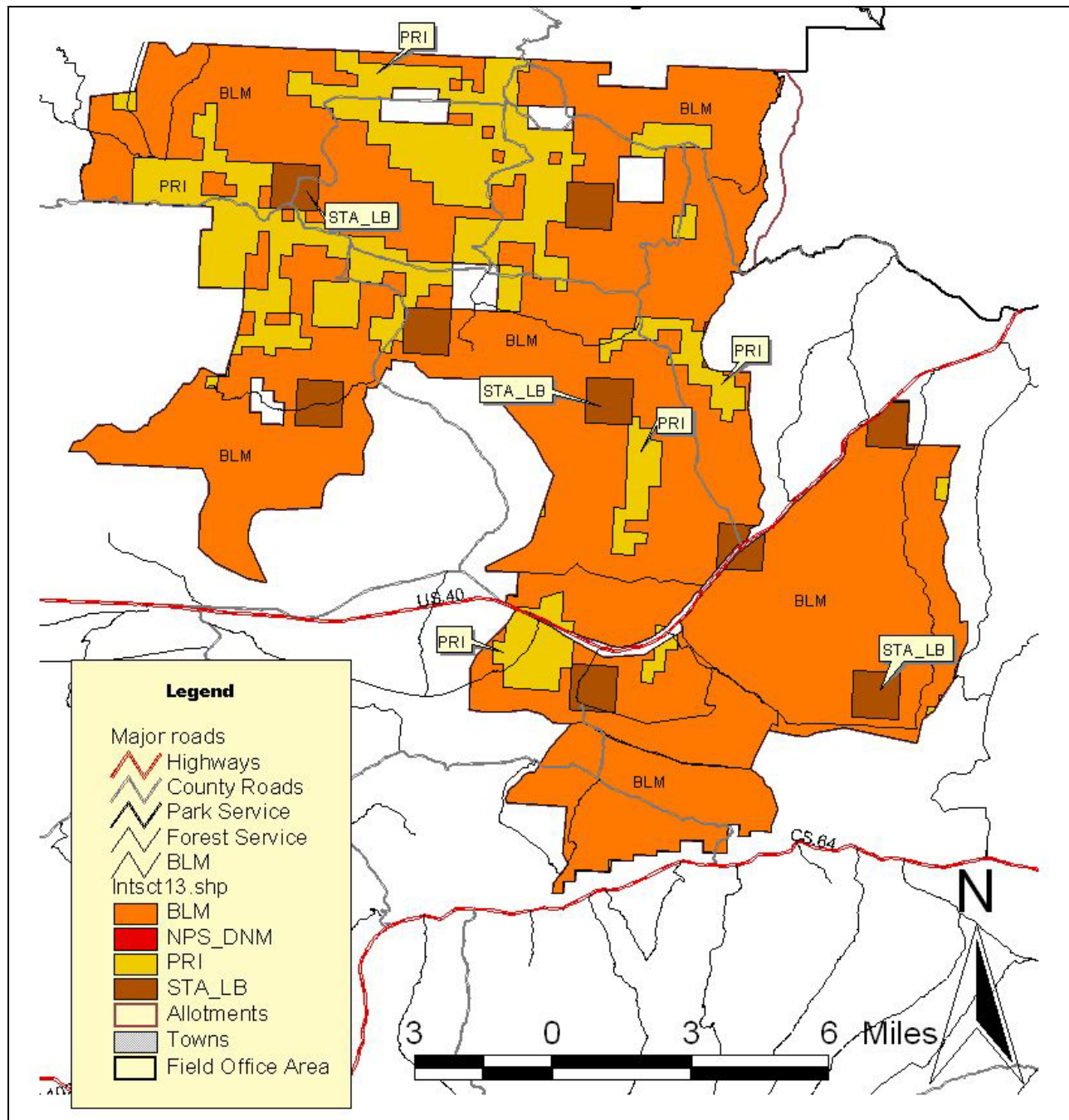
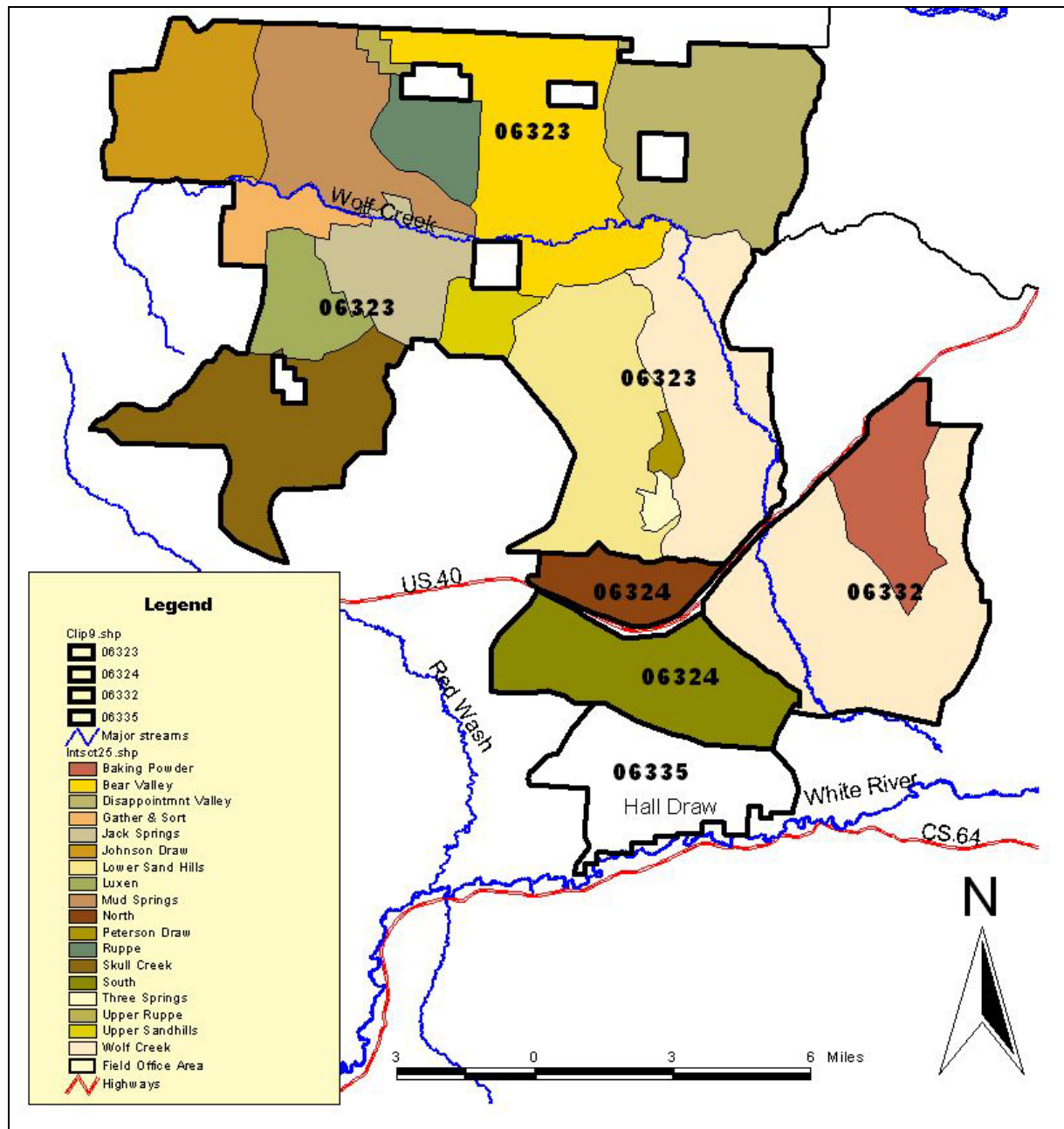


Figure 4: Pastures within the Three Springs Ranch allotments:

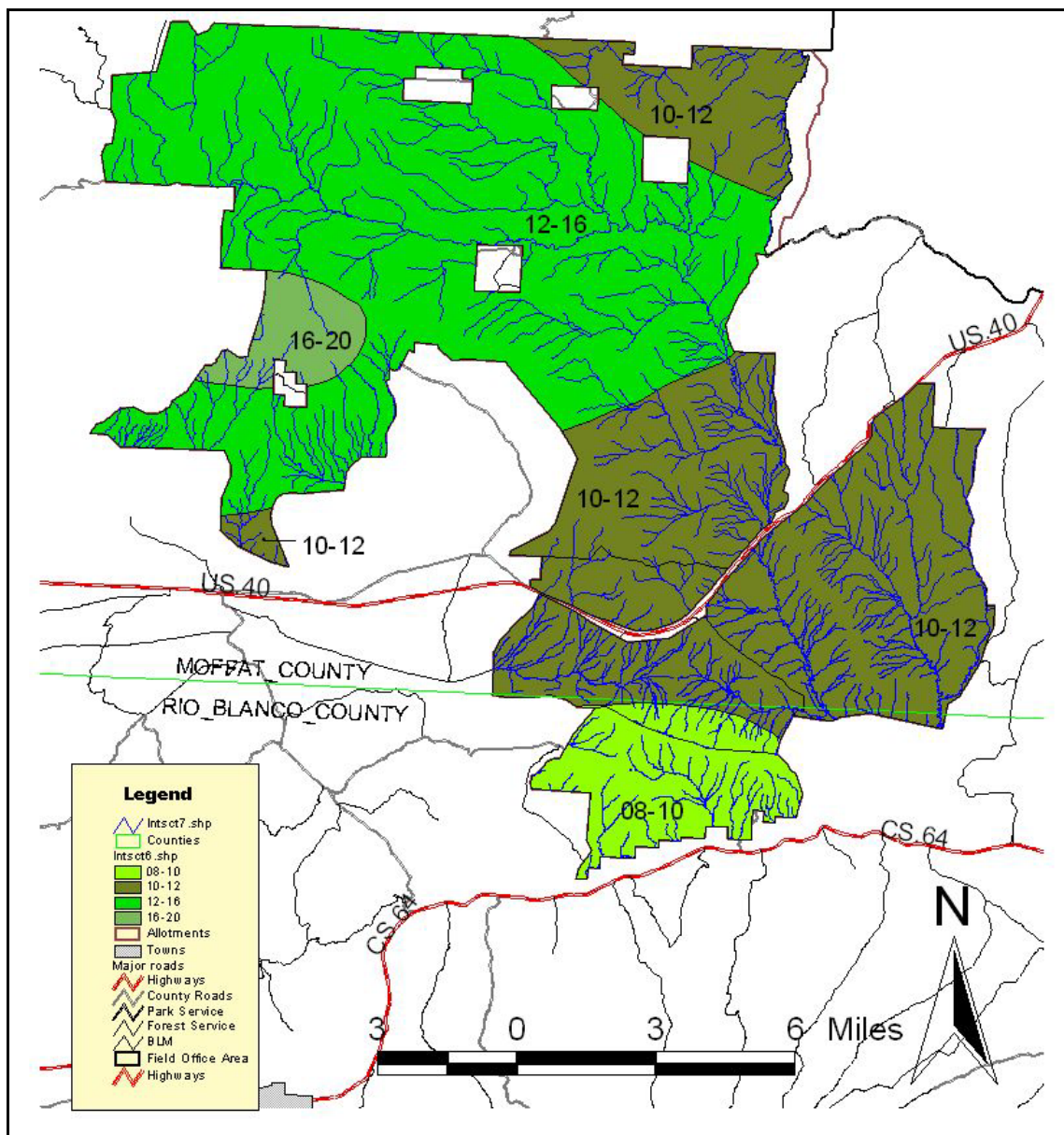
Wolf Creek (06323)
 Massadona (06324)
 Hall Draw (06325)
 Horse Draw (06332)



Climate/Topography:

Annual precipitation within the assessment area varies from approximately 11.5 inches in the lower elevation zone to approximately 20 inches in the high country on Blue Mountain (figure 5). Snowfall, which accounts for about 45% of the annual precipitation, occurs from mid October to late April and accumulates on the ground from January through March.

Figure 5: Precipitation distribution within the assessment area.



Within the North of Highway 40 elevation zone (see below), average precipitation is 13.49 inches at Three Springs Ranch (data from the National Weather Service weather station,

Massadona 3E). The proposed action can be roughly divided into three elevation zones with dominate vegetation classifications as listed below:

- 1: South of Highway 40 – Salt desert shrub, pinion/juniper, and sagebrush communities
 - 5500 ft (Wolf Creek) through 6150 ft (Coal Ridge)
- 2: North of Highway 40 – Sagebrush and pinion/juniper plant communities.
 - 5800 ft (Wolf Creek) through 7050 ft (Sandhills)
- 3: Blue Mountain – Mountain shrub and pinion/juniper plant communities
 - 6600 ft (Peterson Post Flat) through 8700 ft (Tanks Peak)

Topography within the assessment area is highly variable and ranges from sagebrush flats south of highway 40 to steep, rugged hogback ridges near Dinosaur National Monument to the north.

SOILS:

The following data is a product of an order III soil survey conducted by the Natural Resource Conservation Service (NRCS) in Rio Blanco County, CO and Moffat County, CO. The accompanying table highlights important soil characteristics. A complete summary of this information can be found at the White River Field Office.

Rio Blanco County:

Soil Number	Soil Name	Slope	Ecological site	Salinity	Run-Off	Erosion Potential	Bedrock
7	Billings silty clay loam	0-5%	Alkaline Slopes	2-8	Rapid	Moderate to high	>60
8	Billings-Torrifluvents complex gullied	0-5%	Alkaline Slopes/None	2-8	Rapid	High	>60
18	Chipeta-Killpack silty clay loam	3-15%	Clayey Saltdesert	4-16	Rapid	High	10-20
21	Cliffdown-Cliffdown Variant complex	5-65%	Saltdesert Breaks	<2	Medium to slow	Slight to moderate	>60
25	Potts-Begay fine sandy loams	2-7%	Loamy Saltdesert/Sandy Saltdesert	<2	Medium	Moderate	>60
33	Forelle loam	3-8%	Rolling Loam	<2	Medium	Moderate	>60
34	Forelle loam	8-15%	Rolling Loam	<2	Medium	Moderate to high	>60
37	Torriorthents-Rock Outcrop complex	15-90%	Stoney Foothills	-	Rapid	Very high	10-20
53	Moyerson stony clay loam	15-65%	Clayey Slopes	2-4	Rapid	Very high	10-20
64	Piceance fine sandy loam	5-15%	Rolling Loam	<2	Medium	Moderate to high	20-40
66	Potts-Begay fine sandy loams	2-7%	Loamy Saltdesert/Sandy Saltdesert	<2	Medium	Moderate	>60

Soil Number	Soil Name	Slope	Ecological site	Salinity	Run-Off	Erosion Potential	Bedrock
70	Redcreek-Rentsac complex	5-30%	PJ woodlands/PJ woodlands	<2	Very high	Moderate to high	10-20
75	Rentsac-Piceance complex	2-30%	PJ woodland /Rolling Loam	<2	Medium	Moderate to high	10-20
78	Rock Outcrop	50-100%	None	-	Very high	Slight	0
90	Torrifluvents gullied		None	-	Rapid	Very high	>60
91	Torriorthents-Rock Outcrop complex	15-90%	Stoney Foothills	-	Rapid	Very high	10-20
94	Turley fine sandy loam	3-8%	Alkaline Slopes	2-4	Medium	Slight to moderate	>60
95	Uffens loam	0-5%	Alkaline Slopes	4-8	Slow	Moderate	>60
104	Yamac Loam	2-15%	Rolling Loam	<2	Medium	Slight to moderate	>60

Much of the lower Wolf Creek watershed (south of Hwy. 40) occurs upon shale badland soils derived from Mancos Shale. These soils are highly erosive in nature and have extremely high salt/clay content. Sediment yield from this general area is estimated at 5 to 12 tons per acre with some areas producing as much as 20 tons per acre.

Moffat County:

Soil Number	Soil Name	Slope	Ecological site	Salinity	Run-Off	Erosion Potential	Bedrock
1C	Turzo loam, saline	1-8%	Alkaline Slopes	4-8	Slow	moderate	>60
03B	Battlement fine sandy loam	0-3%	Foothills swale	-	very slow	slight	>60
04E	Abor silty clay loam	12-25%	Clayey foothills	-	Rapid	High	20-40
5	Youngston loam	0-3%	Foothills swale	-	very slow	slight	>60
X9E	Grieves-Yamo-Crestman association	3-45%	Clayey foothills; Sandy Juniper woodland	-	Medium	moderate-high	>60
11E	Rentsac-Moyerson-complex	25-65%	Foothill-Juniper woodland	-	medium-rapid	Very high	20-Oct
12D	Avalon-Mack complex	1-12%	None	-	slow	moderate	>60
23D	Ironsprings loamy sand	1-15%	Sandy foothills	-	Slow	moderate	60
26D	Berlake sandy loam	3-12%	Sandy foothills	-	medium	moderate	60
28D	Forelle loam	3-12%	Rolling Loam	-	medium	moderate	>60
32D	Yamo loam	3-15%	Clayey foothills	-	medium	moderate	>60
33D	Pinelli loam	3-12%	Clayey foothills	-	medium	moderate	40-60
39C	Weed sandy loam	1-12%	Deep loam	-	medium	moderate	>60

Soil Number	Soil Name	Slope	Ecological site	Salinity	Run-Off	Erosion Potential	Bedrock
52D	Cushool fine sandy loam	3-12%	Rolling Loam	-	medium	moderate	20-40
58D	Bulkley silty clay	3-12%	Clayey foothills	-	Rapid	moderate	>60
62D	Rock River sandy loam	3-12%	Rolling Loam	-	medium	moderate	>60
68	Clayburn loam, warm	3-25%	Mountain loam	-	medium	High	>60
92C	Almy loam	3-15%	Rolling Loam	-	medium	moderate	>60
101	Torriorthents-Rock Outcrop complex	25-75%	None	-	rapid	Very high	4-30"
103	Ustorthents, frigid-Borolls complex	25-75	None	-	Rapid	Very high	10-30"
110E	Kemmerer silty clay loam	12-25%	Clayey slopes	-	Rapid	High	20-40
115	Coyet-Crestman, moist complex	20-50%	Sandy foothills; loamy breaks	-	medium	high	40-60
116	Greives-Crestman complex	10-40%	Sandy loams; Sandy Juniper woodland	-	medium	High	10-20"
X121	Deaver-Chipeta complex	3-35%	Clayey Salt desert	-	Rapid	Very high	5-20'
X122	Schooner-Tricera complex	5-25%	Sandy Juniper woodland	-	slow-medium	moderate-high	40-60
122	Schooner-Rock outcrop complex	5-45%	Pinyon-Juniper woodland	-	medium	high	20-40
123	Typic Natrargids	0-5%	None	-	medium	moderate	>60
124	Spool-Maybell complex	5-40%	Sandy loam; Sandy foothills	-	medium	high	10-20"
125	Emlin_Tymosling complex	1-15%	Deep loam; Dry exposure	-	medium	moderate	20-40
133	Torriorthents-Rock outcrop, shale, complex	30-75%	None	-	Rapid	Very high	<4
138	Massadona silty clay loam	0-12%	Clayey slopes	-	Rapid	High	<60
142	Brownsto-Castee complex	3-25%	Loamy 10-14 inches	-	medium	moderate-high	>60
142	Billings silty clay loam	0-5%	Alkaline Slopes	2-8	Rapid	Moderate to high	>60
147	Ninot-Crago-Garlips complex	15-45%	Dry Mountain loam; Dry exposures; Mountain loam	-	medium	moderate-high	40-60
149	Kemmerer-Grapit complex	15-65%	Foothills Juniper	-	Rapid	High	20-40
167	Zillion-Barkelew, moist-Grapit complex	25-65%	Mountain loam; Dry exposure	-	Rapid	high-very high	>60
194	Crago-Pensore-Grapit association	6-75%	Pinyon-Juniper woodland	-	medium-rapid	high-very high	10-20'

Soil Number	Soil Name	Slope	Ecological site	Salinity	Run-Off	Erosion Potential	Bedrock
200	Massadadona-Youngston complex, moist	1-8%	Semidesert clay loam; Foothill swale	-	slow-medium	slight-moderate	>60
202	Deaver-Avalon complex	5-45%	Clayey slopes; Semi-desert loam	-	medium-very rapid	moderate-very high	>60
203	Stunner, moist-Emlin complex	1-12%	Deep loam	-	slow	moderate	>60
205	Emlin loam	1-12%	Deep loam	-	medium	Moderate	>60
207	Rencot-Duffymont complex	1-25%	Dry Exposure; Stony loam	-	slow-medium	moderate	4-20"
214	Holter-Detra complex	3-25%	Mountain loam; Deep loam	-	slow-medium	moderate	>60
225	Avalon-Persayo, moist-Degater complex	3-30%	Semi-desert; Clayey slopes	-	medium-rapid	moderate-high	40-60
AW	Fluvaquents and Haplaquolls, frequently flooded	0-2%	None	-	slow-ponded	slight	>60
RL	Rock Outcrop-Torriorthents complex	50-75%	None	-	very rapid	Very high	0

The following table's breakdown the assessed soil units and their associated ecological sites on BLM lands by acres within allotments that are broken down by pastures permitted to Three Springs Ranch.

Wolf Creek Allotment by Pasture:

Wolf Creek Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Battlement Fine Sandy Loam, 0-3% slope	Foothill Swale	158.28
Bulkley silty clay, 3-12% slopes	Stoney Foothills	149.7
Crago-Pensore-Grapit assoc, 6-75% slopes	Stoney Foothills	17.66
Cushool fine sandy loam, 3-12% slopes	None	230.24
Deaver-Avalon complex, 5-45% slopes	None	315.88
Deaver-Chipeta silty clay loam, 3-35% slopes	Foothill Swale	34.42
Eghelm loamy fine sand, 0-3% slopes	Clayey Foothills	102.53
Forelle loam, 3-12% slopes	PJ woodlands/PJ woodlands/PJ woodlands	120.98
Grieves-Yamo-Crestman assoc, 3-45% slope	Rolling Loam	117.79
Kemmerer-Grapit Complex, 15-65% slopes	Clayey Slopes/Semidesert Loam	76.11
Kemmerer-Moyerson Silty Clay Loam, 20-40% slope	Clayey Salt desert/Clayey Salt desert	462.72
Kemmerer-Yamo Complex, 5-30% slopes	Salt desert Overflow	257.19
Massadadona Silty Clay Loam, 0-12% slopes	Rolling Loam	0.29
Massadadona-Youngston loams, Moist, 1-8% slopes	Rolling Loam/Clayey Foothills/Sandy Juniper	166.28

Wolf Creek Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Rentsac-Moyerson-Complex,25-65%slope	Juniper woodlands/Juniper woodlands	232.59
Rock River sandy loam,3-12%slopes	Clayey Slopes/Clayey Slopes	737.2
Rock Outcrop-Torriorthents Complex, Very Steep	Clayey Slopes	563.08
Schooner-Rock outcrop Complex,5-45%slopes	Clayey Slopes	862.29
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Foothill Swale	404.48
Torriorthents-Rock Outcrop, Shale, Complex, Steep	PJ woodlands/PJ woodlands	1184
Torriorthents-Torripsamments complex, Mod Steep	Rolling Loam	166.58
Typic Natrargids, 0-5%slopes	None	1272
Youngston Sandy Loam, well drained,0-3%slopes	PJ woodlands/None	445.66
Total		8078

Jack Springs Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Almy loam,3-15%slopes	Rolling Loam	271.87
Brownsto-Castello complex,3-25%slopes	Loamy 10-14/Loamy 10-14	306.8
Crago-Pensore-Grapit assoc,6-75%slopes	PJ woodlands / PJ woodlands / PJ woodlands	1082.85
Cushool fine sandy loam, 3-12%slopes	Rolling Loam	64.11
Forelle loam,3-12%slopes	Rolling Loam	797.93
Forelle, Alkaline-Emlin loams,1-12%slopes	Deep Loam/Deep Loam	648.42
Grieves-Crestman-Complex,10-40%slopes	PJ woodlands/PJ woodlands	3.86
Ironsprings loamy sand,1-15%slopes	Sandy Foothills	18.42
Kemmerer-Grapit Complex, 15-65%slopes	Juniper woodlands/Juniper woodlands	511.91
Rock Outcrop-Torriorthents Complex, Very Steep	None	1050.32
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	3470.15
Torriorthents-Torripsamments complex ,M Steep	None	182.56
Yamo Loam, 3-5%slopes	Clayey Foothills	366.32
Total		8775.52

Lower Sandhills Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Almy loam,3-15%slopes	Rolling Loam	0.16
Battlement Fine Sandy Loam, 0-3% slope	Foothill Swale	38.93
Eghelm loamy fine sand,0-3%slopes	Salt desert Overflow	598.09
Rock River sandy loam,3-12%slopes	Rolling Loam	136.95
Rock Outcrop-Torriorthents Complex, Very Steep	None	1490.05
Schooner-Rock outcrop Complex,5-45%slopes	PJ woodlands/None	850.37
Schooner-Rock outcrop Complex,5-45%slopes	PJ woodlands/Semidesert SL	407.33
Spool-Maybell Loamy fine Sands,5-40%slopes	Sandy Loam/Sandy Foothills	3811.53
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	277.62

Lower Sandhills Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Torriorthents-Torripsamments complex, M Steep	None	240.15
Youngston Sandy Loam, well drained,0-3%slopes	Foothill Swale	7.63
Total		7858.81

Ruppe Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Crago-Pensore-Grapit assoc,6-75%slopes	PJ woodlands/PJ woodlands	0.26
Forelle, Alkaline-Emlin loams,1-12%slopes	Deep Loam/Deep Loam	65.44
Grieves-Crestman-Complex,10-40%slopes	PJ woodlands/PJ woodlands	64.52
Rencot-Duffymont Complex,1-25%slopes	Dry Exposure/Stoney Loam	340.63
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	415.9
Zillion-Barkelew-Grapit Complex,25--65%slps	Mountain Loam/Dry Exposure	150.08
Total		1036.83

Upper Ruppe Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Emlin loam,1-12%slopes	Deep Loam	4.09
Holter-Detra variant complex,3-25%slopes,ExStoney	Mountain Loam/Deep Loam	1.65
Rencot-Duffymont Complex,1-25%slopes	Dry Exposure/Stoney Loam	18.43
Ustorthents, Frigid-Borolls Complex, steep	None	0.05
Zillion-Barkelew-Grapit Complex,25--65%slps	Mountain Loam/Dry Exposure	27.3
Total		51.52

Jack Springs Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Almy loam,3-15%slopes	Rolling Loam	322.96
Berlake sandy loam,3-12%slopes	Sandy Foothills	111.5
Emlin loam,1-12%slopes	Deep Loam	0.06
Layoint- Moosed- Berlake Complex,1-20%slopes	Sandy Foothills/Sandy Foothills/ Deep Loam	3.38
Martinsdale-Boettcher Complex,1-15%slopes	Deep Loam, Dry Exposure	106.01
Pinelli loam, 3-12%slopes	Clayey Foothills	99.19
Rock River sandy loam,3-12%slopes	Rolling Loam	103.42
Rock Outcrop-Torriorthents Complex, Very Steep	None	96.15
Spool-Maybell Loamy fine Sands,5-40%slopes	Sandy Loam/Sandy Foothills	366.36
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	458.75
Ustorthents, Frigid-Borolls Complex, steep	None	201.57

Jack Springs Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Weed sandy loam,1-12%slopes	Deep Loam	42.59
Zillion-Barkeleyw-Grapt Complex,25--65%slps	Mountain Loam/Dry Exposure	42.89
Total		1954.83

Upper Sandhills Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Eghelm loamy fine sand,0-3%slopes	Salt desert Overflow	5.32
Rock River sandy loam,3-12%slopes	Rolling Loam	1.84
Rock Outcrop-Torriorthents Complex, Very Steep	None	36.43
Spool-Maybell Loamy fine Sands,5-40%slopes	Sandy Loam/Sandy Foothills	973.9
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	255.97
Total		1273.46

Luxen Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Emlin loam,1-12%slopes	Deep Loam	329.02
Layoint-Moosed-Berlake Complex,1-20%slopes	Sandy Foothills/Sandy Foothills/Deep Loam	437.59
Martinsdale-Boettcher Complex,1-15%slopes	Deep Loam, Dry Exposure	389.6
Niart-Crago-Garlips Complex,15-45%slopes	Dry Mountain Loam/Dry Exposure/ Mountain Loam	167.11
Spool-Maybell Loamy fine Sands,5-40%slopes	Sandy Loam/Sandy Foothills	0.02
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	0.66
Ustorthents, Frigid-Borolls Complex, steep	None	116.65
Weed sandy loam,1-12%slopes	Deep Loam	4.47
Total		1445.12

Luxen Pasture (Former Gather & Sort Pasture) Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Emlin loam,1-12%slopes	Deep Loam	22.16
Haplaquolls, frequently flooded	None	1.86
Layoint-Moosed-Berlake Complex,1-20%slopes	Sandy Foothills/Sandy Foothills/Deep Loam	13.47
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	97.59
Ustorthents, Frigid-Borolls Complex, steep	None	182.75
Weed sandy loam,1-12%slopes	Deep Loam	45.76
Total		363.59

Skull Creek Pasture Livestock Grazing Capacity		
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Soil Unit	Ecological Site	BLM Acres
Almy loam,3-15%slopes	Rolling Loam	307.9
Eghelm loamy fine sand,0-3%slopes	Salt desert Overflow	88.64
Grieves-Yamo-Crestman assoc,3-45%slope	Rolling Loam/Clayey Foothills/Sandy Juniper	116.6
Martinsdale-Boettcher Complex,1-15%slopes	Deep Loam, Dry Exposure	1003.67
Rock Outcrop-Torriorthents Complex, Very Steep	None	2867
Schooner-Rock outcrop Complex,5-45%slopes	PJ woodlands/None	3473.86
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	406.06
Total		8263.73

Mud Springs Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Emlin loam,1-12%slopes	Deep Loam	282.78
Forelle, Alkaline-Emlin loams,1-12%slopes	Deep Loam/Deep Loam	147.61
Holter-Detra variant complex,3-25%slopes,ExStoney	Mountain Loam/Deep Loam	7.88
Niart-Crago-Garlips Complex,15-45%slopes	Dry Mountain Loam/Dry Exposure/ Mountain Loam	74.09
Rencot-Duffymont Complex,1-25%slopes	Dry Exposure/Stoney Loam	1863.14
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	902.12
Ustorthents, Frigid-Borolls Complex, steep	None	1198.79
Zillion-Barkelew-Graptit Complex,25--65%slps	Mountain Loam/Dry Exposure	868.37
Total		5344.78

Johnson Draw Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Clayburn loam,3-25%slopes	Mountain Loam	233.29
Emlin loam,1-12%slopes	Deep Loam	1296.41
Holter-Detra variant complex,3-25%slopes,ExStoney	Mountain Loam/Deep Loam	53.16
Niart-Crago-Garlips Complex,15-45%slopes	Dry Mountain Loam/Dry Exposure/Mountain Loam	1.22
Rencot-Duffymont Complex,1-25%slopes	Dry Exposure/Stoney Loam	1017.5
Torriorthents-Rock Outcrop, Sandstone Complex,	Stoney Foothills	3.66
Ustorthents, Frigid-Borolls Complex, steep	None	1438.61
Zillion-Barkelew-Graptit Complex,25--65%slps	Mountain Loam/Dry Exposure	552.31
Total		4596.16

Bull Pasture Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Berlake sandy loam,3-12%slopes	Sandy Foothills	8.87
Emlin loam,1-12%slopes	Deep Loam	55.98
Torriorthents-Rock Outcrop, Sandstone Complex,	Stoney Foothills	25.76

Bull Pasture		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
VS		
Ustorthents, Frigid-Borolls Complex, steep	None	1.38
Zillion-Barkelew-Grapit Complex, 25--65%slps	Mountain Loam/Dry Exposure	109.96
Total		201.95

Horse Draw Allotment by Pasture

Horse Draw Pasture		
Livestock Carrying Capacity		
Soil Unit	Ecological Site	BLM Acres
Billings-Torrifluvents complex, gullied, 0-5% slopes	Alkaline Slopes	47.87
Chipeta-Killpack silty clay loam, 3-15% slopes	Clayey Saltdesert	179.29
Cliffdown-Cliffdown Variant complex, 5-65% slopes	Saltdesert Breaks	16.55
Deaver-Avalon complex, 5-45% slopes	Clayey Slopes/Semidesert Loam	1089.25
Deaver-Chipeta silty clay loam, 3-35% slopes	Clayey Saltdesert/Clayey Saltdesert	5466.73
Eghelm loamy fine sand, 0-3% slopes	Saltdesert Overflow	191.15
Glenton sandy loam, 1-6% slopes	Alkaline Slopes	5.11
Gullied land	None	142.49
Kemmerer-Moyerson Silty Clay Loam, 20-40% slope	Clayey Slopes/Clayey Slopes	7.69
Massadona Silty Clay Loam, 0-12% slopes	Clayey Slopes	3681.66
Massadona-Youngston loams, Moist, 1-8% slopes	Foothill Swale	342.93
Pavillion-Degater Complex, 3-20% slopes	Semidesert Loam/Clayey Slopes	436.35
Torrifluvents, gullied	None	250.43
Torrorthents-Rock Outcrop, Shale, Complex, Steep	Stoney Foothills	360.68
Typic Natrargids, 0-5% slopes	None	279.34
Uffens loam, 0-5% slopes	Alkaline Slopes	68.81
Total		12566.33

Massadona Allotment by Pasture

South Pasture		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Avalon-Persayo-Degater complex, 3-30% slopes	Semidesert Loam /Semidesert Loam /Clayey Slopes	46.41
Billings-Torrifluvents complex, gullied, 0-5% slopes	Alkaline Slopes	581
Chipeta-Killpack silty clay loam, 3-15% slopes	Clayey Saltdesert	909.7
Deaver-Avalon complex, 5-45% slopes	Clayey Slopes/Semidesert Loam	59
Deaver-Chipeta silty clay loam, 3-35% slopes	Clayey Saltdesert/Clayey Saltdesert	1706.35
Divide Creek Detention Dam	None	11.44
Eghelm loamy fine sand, 0-3% slopes	Saltdesert Overflow	149.18

South Pasture		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Eghelm Loamy Sand,0-3%slopes	Salt desert Overflow	19.06
Massadona Silty Clay Loam,0-12%slopes	Clayey Slopes	1189.21
Massadona-Youngston loams,Moist,1-8%slopes	Foothill Swale	199
Rentsac-Moyerson-Complex,25-65%slope	PJ woodlands/PJ woodlands	109.27
Rock Outcrop	None	359.64
Rock Outcrop-Torriorthents Complex, Very Steep	None	254.46
Torrifluents, gullied	None	193.99
Turley fine sandy loam,3-8%slopes	Alkaline Slopes	14.28
Turley loam,Saline,1-8%slopes	Alkaline Slopes	11.89
Total		5813.88

North Pasture		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Abor silty clay loam,12-25%slopes	Claypan	112.49
Bulkley silty clay,3-12%slopes	Clayey Foothills	36
Deaver-Avalon complex,5-45%slopes	Clayey Slopes/Semidesert Loam	0.09
Deaver-Chipeta silty clay loam,3-35%slopes	Clayey Salt desert/Clayey Salt desert	4.49
Eghelm loamy fine sand,0-3%slopes	Salt desert Overflow	27.85
Kemmerer-Moyerson Silty Clay Loam,20-40%slope	Clayey Slopes/Clayey Slopes	136.12
Kemmerer-Yamo Complex, 5-30%slopes	Clayey Slopes	61.56
Massadona Silty Clay Loam,0-12%slopes	Clayey Slopes	51.61
Massadona-Youngston loams,Moist,1-8%slopes	Foothill Swale	7.25
Rentsac-Moyerson-Complex,25-65%slope	PJ woodlands/PJ woodlands	646.73
Rock River sandy loam,3-12%slopes	Rolling Loam	149.84
Rock Outcrop-Torriorthents Complex, Very Steep	None	651.89
Schooner-Rock outcrop Complex,5-45%slopes	PJ woodlands/None	187.61
Spool-Maybell Loamy fine Sands,5-40%slopes	Sandy Loam/Sandy Foothills	1.2
Torriorthents-Rock Outcrop, Sandstone Complex, VS	Stoney Foothills	74.48
Torriorthents-Torripsamments complex, M Steep	None	441.43
Total		2590.64

Hall Draw Allotment

Hall Draw Allotment		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Billings silty clay loam,0-5%slopes	Alkaline Slopes	9.26
Billings-Torrifluents complex,gullied,0-5%slopes	Alkaline Slopes/None	1.37
Cliffdown-Cliffdown Variant complex,5-65%slopes	Salt desert Breaks	339.26

Hall Draw Allotment		
Livestock Grazing Capacity		
Soil Unit	Ecological Site	BLM Acres
Colorow sandy loam	Sandy Saltdesert	2.07
Forelle loam, 3-8%slopes	Rolling Loam	198.84
Forelle loam, 8-15%slopes	Rolling Loam	87.55
Moyerson stony clay loam,15-65%slopes	Clayey Slopes	84.26
Piceance fine sandy loam,5-15%slopes	Rolling Loam	108.77
Potts-Begay fine sandy loams,2-7%slopes	Loamy Saltdesert / Sandy Saltdesert	189.84
Redcreek-Rentsac complex,5-30%slopes	PJ woodlands/PJ woodlands	70.02
Rentsac-Piceance complex,2-30%slopes	PJ woodland/Rolling Loam	1049.28
Rock Outcrop	None	3333.09
Torrifluvents, gullied	None	162.92
Torriorthents-Rock Outcrop, complex,15-90%slopes	Stoney Foothills	525.99
Turley fine sandy loam,3-8%slopes	Alkaline Slopes	589.36
Uffens loam,0-5%slopes	Alkaline Slopes	113.58
N/A	None	3.51
Yamac Loam,2-15%slope	Rolling Loam	108.21
	Total	6977.18

Soils that are occupied with plant communities rated as a mid seral, late seral, or Potential Natural Community (PNC) have sufficient cover of desirable plant species to produce adequate litter and ground cover to minimize runoff and provide for soil protection (refer to the Vegetation section for ratings). These soils are meeting the Colorado Public Land Health Standard for upland soils.

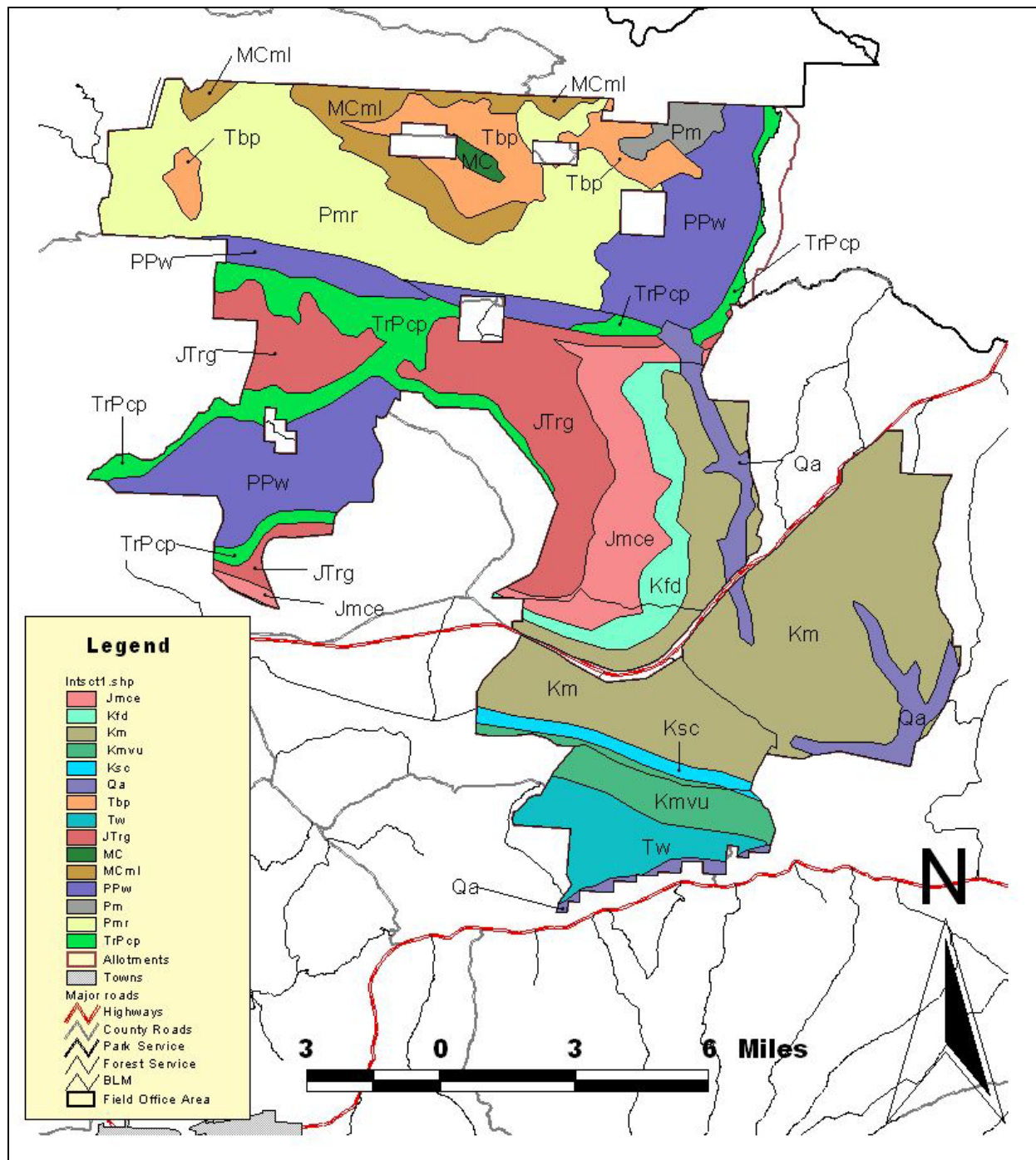
Soils that have sites rated as early seral plant communities do not have sufficient diversity and/or cover of native plant species to provide effective ground cover to prevent overland flow, runoff, and general soil degradation. These soils are experiencing a certain degree of pedestaling, minor expression of rills, and some areas have active gully erosion. Erosion is most evident within the salted communities whose soils have high clay content (Massadona, Horse Draw). These areas that are experiencing active erosion are typically found along major drainages (Divide Creek, Wolf Creek, Box Elder, Hall Draw, etc.) that have downcut in the distant past, which has caused the side drainages to downcut to the level of the major drainages to obtain equilibrium. The early seral sites have soils that are typically within drainage bottoms and toe slopes that are found on ecological sites such as Clayey Slopes, Alkaline Slopes/None, Torrifluvents gullied, Clayey Salted/Clayey Salted, foothill swale, salted overflow, and rolling loam (Hall Draw allotment). These early seral sites are not meeting land health standards.

Soils that occupy early seral communities are mostly not meeting the Standards due to the lack of soil protection caused from a significant composition of cheatgrass, an invasive annual grass, and due to the mono-cultures in some greasewood and sagebrush communities. All other seral communities (Mid – PNC) are currently meeting standards and make up the bulk of acres on all allotments.

GEOLOGY:

The assessed area is situated in the Colorado Plateau, and Wyoming Basin physiographic province and is dominantly composed of sedimentary rock of the Tertiary and Cretaceous period. Figure 6 illustrates mapped surface geology within the assessment area.

Figure 6: Surface geology within the assessment area.



The following descriptions of the existing surface geology is a product of the Geologic Map of the Vernal 1°X 2° Quadrangle Colorado, Utah and Wyoming.

Qa – Alluvium (Holocene): composed of channel and floodplain deposits of major drainages.

Tbp – Browns Park Formation (Miocene): light gray to tan, poorly-moderately consolidated tuffaceous sandstone. Mostly of fluvial and eolian origin.

Tw – Wasatch Formation (Eocene and Paleocene): Soft, light-gray, red, green, white, yellow, and purple claystone, shale, sandstone, siltstone, and conglomeratic sandstone. Of fluvial and lacustrine origin.

Kmvu – Mesaverde Group (Upper Cretaceous): Resistant, tan, light-gray, and yellow lenticular crossbedded sandstone and subordinate shale, carbonaceous shale, and minor coal.

Ksc – Sego Sandstone, Buck Tongue of Mancos Shale, and Castlegate Sandstone (Upper Cretaceous):

- Sego Sandstone: Resistant, light-gray, tan, buff, and orange marine sandstone and shale.
- Buck Tongue: Soft, medium/dark-gray, yellow weathering marine shale and tan local thin-bedded sandstone.
- Castlegate sandstone: Resistant, light-gray, yellow and tan marine sandstone and minor shale

Km – Mancos Shale (Upper Cretaceous): Soft, medium/dark-gray, yellow-weathering marine shale and minor siltstone and sandstone.

Kfd – Frontier Sandstone and Mowry Shale Members of the Mancos Shale, and Dakota Sandstone (Upper and Lower Cretaceous):

- Frontier Sandstone Member of Mancos Shale (Upper Cretaceous): Resistant, yellow and tan, locally crossbedded marine sandstone and minor carbonaceous shale and coal.
- Mowry Shale Member of Mancos Shale (Lower Cretaceous): Soft, silver-gray and bluish-gray, siliceous marine shale and bentonite.
- Dakota Sandstone (Lower Cretaceous): Resistant, yellow and light-gray, crossbedded mostly fluvial sandstone and subordinated pebble conglomerate, and minor shale and coal.

Jmsc – Morrison Formation, Stump Formation, Entrada Sandstone, and Carmel Formation (Upper and Middle Jurassic):

- Stump Formation: Consists of two members of marine origin: the Redwater Member (Upper Jurassic) which is a soft, olive-green and light-green, fissile glauconitic shale and siltstone and sparse interbedded tan and gray, ripple-marked sandy glauconitic oolitic limestone and fossiliferous sandstone; and the

underlying Curtis Member (Middle Jurassic) which is a resistant, light-gray crossbedded fossiliferous glauconitic sandstone.

- Entrada Sandstone (Middle Jurassic): Resistant, light-gray, buff, or pink, prominently crossbedded sandstone. Largely of eolian origin.
- Carmel Formation (Middle Jurassic): Soft, medium/dark-red and green, sandy shale, sandstone, siltstone, mudstone, and gypsum. Of marine origin.

JTrg – Glen Canyon Sandstone (Lower Jurassic and Upper Triassic): Resistant, pink, light-gray, and buff, prominently crossbedded sandstone. Largely of eolian origin.

TrPcP – Chinle, Moenkopi, and Park City Formations (Triassic): Red siltstone and sandstones.

PPw – Weber Sandstone (Pennsylvanian): Resistant, light-gray and buff, prominently crossbedded sandstone of eolian origin.

Pmr – Morgan Formation and Round Valley Limestone (Pennsylvanian):

- Round Valley Limestone: Resistant, light/medium gray and blue-gray limestone and interbedded soft light-gray shale of marine origin. Limestone generally fossiliferous and contains red and pink chert concretions.

Mc – Leadville Limestone (Mississippian): Limestone

MCml – Madison Limestone, Lodore Formation (Mississippian): Shale, limestones, and sandstones.

Currently there is no oil and gas development or active mining claims within the assessment area. However, with the combination of the recent push for oil and gas development throughout the west and potential of existing oil and gas reservoirs underlying the Hall Draw, Horse Draw, and Massadona allotments, future development seems likely (see figure 8). Figure 7 shows mineral ownership within the assessment area.

Figure 7: Mineral ownership within the Three Springs assessment area.

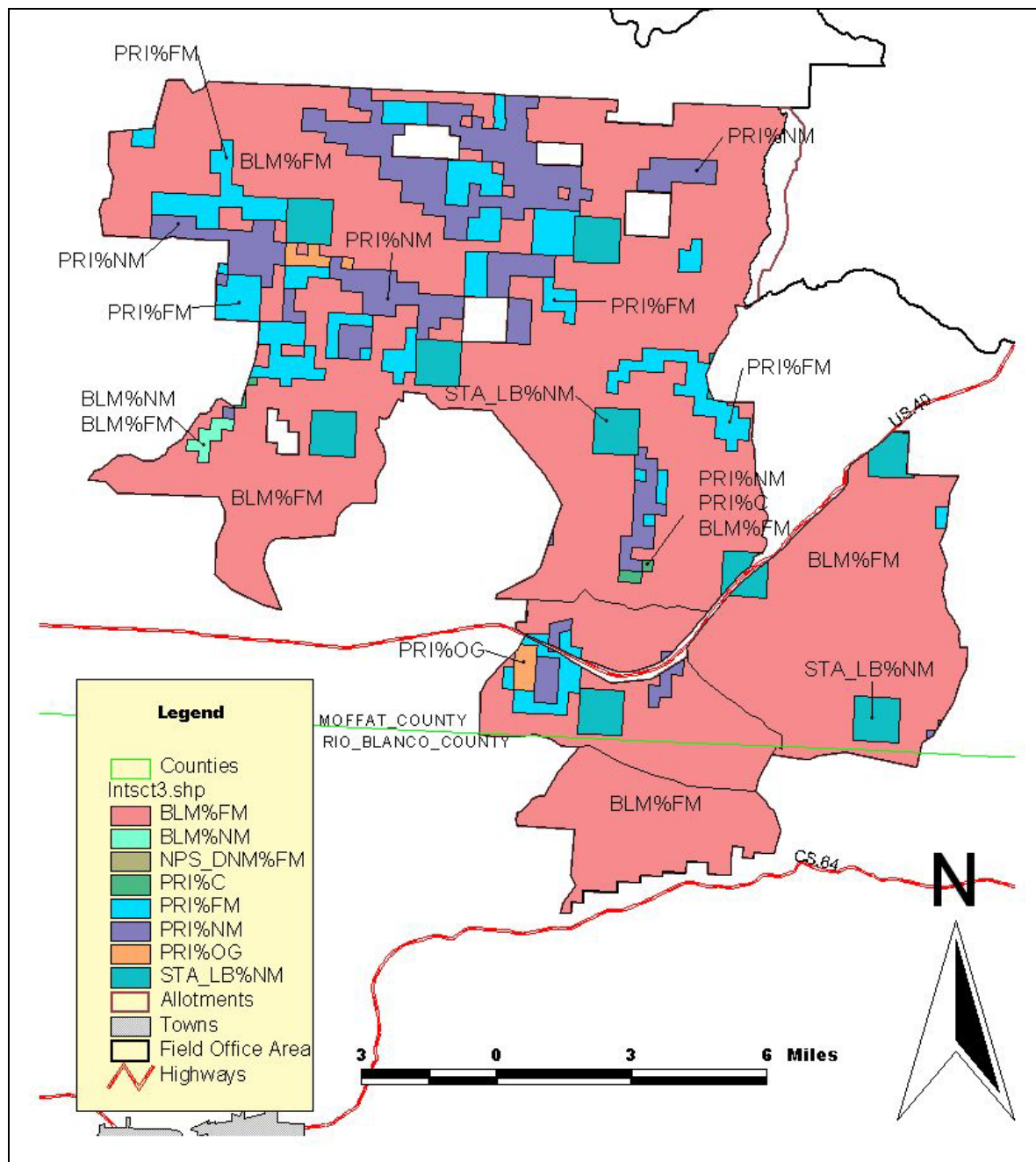
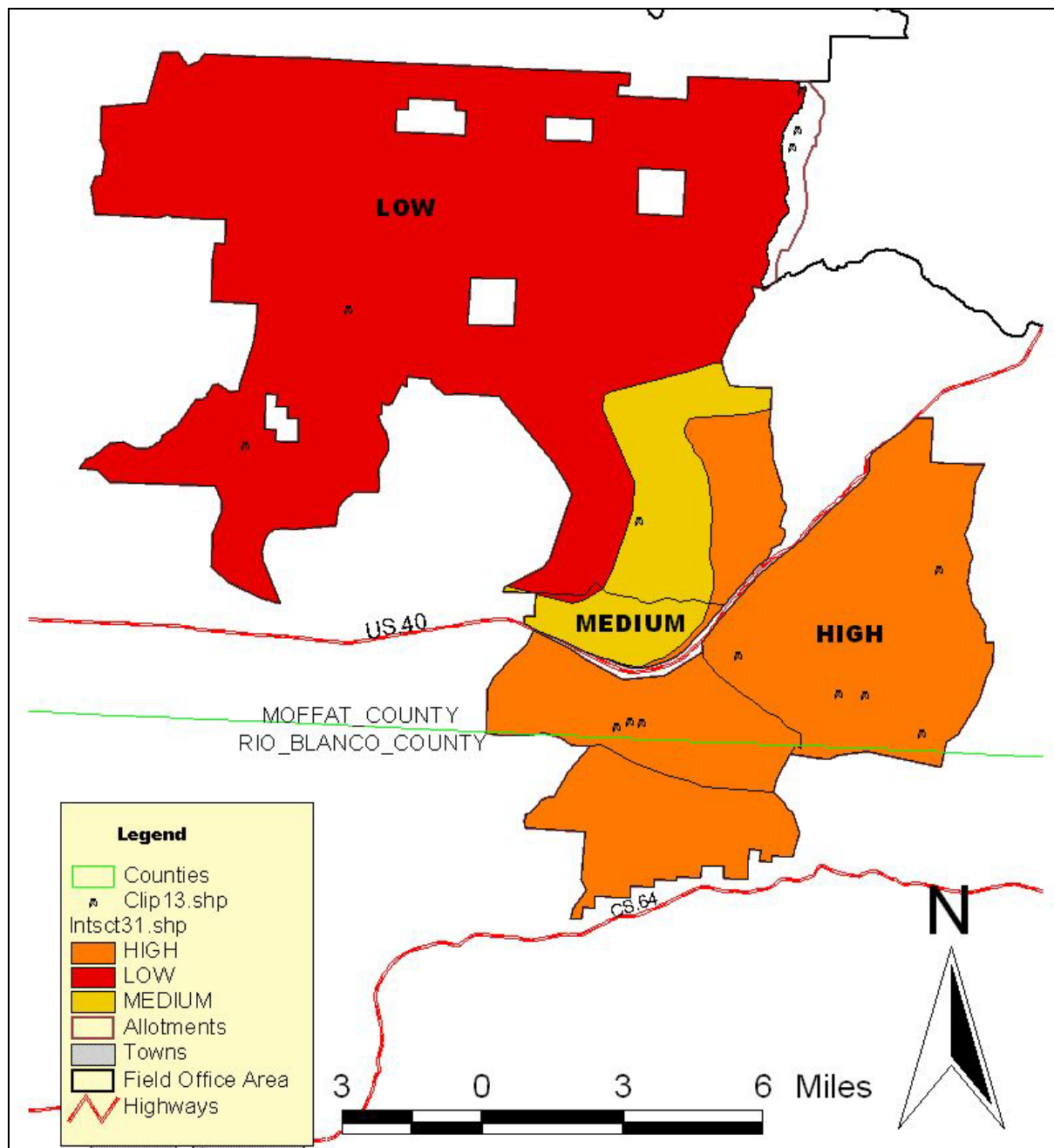


Figure 8: Oil and Gas potential within the assessment area including existing oil and gas wells



RIPARIAN:

Massadona allotment: Within the Massadona allotment is located Divide Creek Dam (RI #1151), which supports a lentic (standing water) riparian community along the shoreline (9/10 mile, 5 acres). Dominate plant communities include bulrushes, cottonwoods (narrow leaf & Freemont),

willows, tamarisks, Russian olives, and cattails. Limited to the northern portion of the reservoir are Canada thistles. Divide Creek Dam was inventoried for Proper Functioning Condition (PFC) in July of 2005. It has also been assessed in 2002, 2003, and 2004. This reservoir has been rated as Proper Functioning Condition for all inventory dates. Divide Creek Dam is fed by an underground source and is subject to low water levels and at times may go dry. A fenceline (R.I. #1078) surrounds the reservoir, but a lack of adequate maintenance has allowed cattle to access the site. However, as shown by the rating, cattle are having no discernable effect on the functionality of the riparian system.

The Horse Draw well on BLM administered lands supports a riparian community for approximately 1/2 mile below the source and is located in the north pasture of the allotment. This stretch of riparian zone was inventoried for PFC during May of 2005. The area supports a robust community of cattails, bulrushes, willows, and a few cottonwoods. The system was rated as Proper Functioning Condition.

Horse Draw allotment: The Wolf Creek drainage traverses down the western portion of the allotment. This stretch was inventoried for PFC on August 1st of 2002 and delineated two segments of 2 miles and 5 miles, for a total of 7 miles. Riparian zones are intermittent within these segments, dependent upon surface and subsurface water availability. Influences by cattle on the functionality of the system are negligible, with some localized trampling near roads and fences.

The 2-mile segment was rated as Proper Functioning Condition with good vegetation on banks and point bars, including willows and cottonwoods, allowing for vertical stability. Riparian vegetation includes obligate and facultative streambank vegetation.

The 5-mile segment was rated as Functional at Risk with an upward trend. The rating was related to the concern of noxious weeds, and the ephemeral system being entrenched. Positive aspects of the system include good deposition and vertical stability. In comparison to the 2-mile stretch, there are fewer willows due to less water availability.

Hall Draw allotment: There are no known riparian plant communities that exist in this area.

Wolf Creek allotment: The bulk of riparian zones on the Wolf Creek allotment are associated with private land, as these areas were previously homesteaded. Known riparian communities on BLM administered lands are located in Peterson Draw (1/2 mile) (figure 9), Three Springs Draw/Yellow Cat Draw (1 ½ miles) (figure 10), Peterson Draw Reservoir #2 (4/10 mile, 3 acres, #1111) (figure 11), Bear Canyon (9/10 mile, Bear Spring-#0278, Sandhills Spring-#0276) (figure 13), and a portion of Wolf Creek (1 mile) (figure 12). Little Red Wash was inventoried for PFC in September of 1995; however no riparian characteristics were identified within the drainage.

Within Peterson Draw (Wolf Creek Pasture), a riparian community on BLM administered lands is supported from upstream flowing water wells located on private land. This stretch of riparian zone was inventoried for PFC during May of 2005. This riparian system is supported and obligated to the upstream development of flowing wells located in private land. Peterson Draw

Reservoir #1 (figure 9) is located within the drainage and is largely filled in with sediment, thus limiting its water holding capacity.

Figure 9: Peterson Draw Reservoir #1 (7/2005)



The riparian zone is largely limited to the channel above the reservoir. Dominate riparian plants include cattails, limited willows, sedges, and bulrushes, with limited tamarisks and a couple of Russian olives. Sedges provide a nearly continuous cover throughout the system. Also, perennial pepperweed (tall whitetop), an invasive and noxious weed, is found within this drainage on a limited basis. The saturation zone of the channel is expanding laterally, as there are juniper trees within the channel that have recently died (over saturation). An apparent causative factor

for this lateral expansion may be due to the reservoir being full of sediment, thus water is not accumulating within the reservoir and the water is being forced to saturate the soils upstream of this reservoir. Overall, this riparian section received a rating of Proper Functioning Condition with concern over the occurrence of perennial pepperweed which is present, not dominate, within the plant community.

Figure 10: Three Springs Draw (7/2005)



The riparian zone within Three Springs Draw/Yellow Cat Draw (figure 10) is similar to that of Peterson Draw #1 (figure 9) and was inventoried for PFC in July of 2005. The riparian community on BLM administered lands is supported and obligated to upstream flowing water wells located on private land. Dominate riparian plants include sedges, rushes, cattails, and willows. Willows of all age classes are more dominate within this channel then that of Peterson Draw. The saturation zone of the channel is expanding laterally, as there are juniper trees

within the channel that have recently died (over saturation). Overall, this riparian section is similar to that of Peterson Draw and is functioning.

Figure 11: Peterson Draw Reservoir #2 (7/2005)



Peterson Draw Reservoir #2 (figure 11) supports a lentic (standing water) riparian community along the shoreline (3 acres) in the Wolf Creek Pasture. Dominate plant communities include bulrushes and cattails. Peterson Draw Reservoir #2 was inventoried for PFC during July of 2005, 2004, and 2002. During all inventories, the area was rated as Proper Functioning Condition. This reservoir is fed by an underground source and is subject to low water levels and at times may go dry. A fenceline (#1112) surrounds the reservoir, but a lack of adequate maintenance has

allowed cattle to access the site. Cattle are typically entering the site for watering purposes at the dam location and then exiting the site using the same route. Outside of the dam, cattle make little use of the riparian system. As shown by the functional rating, cattle are having no discernable effect on the functionality of the riparian system.

Figure 12: Wolf Creek reach #1 (9/1995)



The Wolf Creek drainage was inventoried for PFC in September of 1995. Four segments were delineated during this inventory, however only one segment for 1 mile (reach #1, figure 12) had intermittent riparian characteristics, which has private land above and below the segment. The remainder of the drainage (reach #2-4) did not express riparian characteristics on BLM administrated lands. Reach #1 was rated as Functional-At Risk with a Not Apparent trend due to a straight streambed within a slight gully.

The Bear Canyon drainage was inventoried for PFC in July of 2005 and September of 1995. Five segments were delineated during these inventories, however only one segment for 0.9 miles had riparian characteristics throughout much of the reach. Riparian plant species within the reach include rushes, sedges, redtop, Kentucky bluegrass, and a few box elder trees.

Figure 13: Bear Canyon (10/2005)



During the 1995 inventory of Bear Canyon, the riparian reach was rated as Functional-At Risk with a downward trend due to a recent thunderstorm flow event (the day before the inventory) that flattened and uprooted a portion of the riparian community and due to a headcut at the base of the reach which ends at a rock face. The 2005 inventory rated this reach (figure 13) as Functional- At Risk with an upward trend. A few small headcuts (drops of ½ ft. to 2 ft.) are present near the spring source in the channel, which are partially reinforced with riparian vegetation (sedges). The inventories classified the segment as having a riparian zone that has achieved its potential extent with a diverse composition of riparian vegetation that exhibit high vigor and present species indicate maintenance of riparian soil moisture. The spring sources are developed with short pipelines feeding two water troughs, which serve as the primary water source for

the Upper Sandhills pasture. The riparian zones are confined to natural walled channels and a burn has greatly increased the upland forage availability for livestock and wildlife, thus reducing grazing pressure within the riparian channel.

VEGETATION:

The following tables list the plant community appearance for the Ecological sites or woodland types within the study area, along with the predominant plant species comprising the composition of each community. Forb species, though important to the diversity of a community and making up 25% to 30% of the composition of several of the plant communities listed, are not presented in the following table because they generally are not contributors to the appearance or dominance of the community.

Ecological Site / Woodland Type	Plant Community Appearance	Predominant Plant Species in the Plant Community
Alkaline Slopes	Sagebrush/grass Shrubland	Wyoming big sagebrush, winterfat, low rabbitbrush, wheat grasses, Indian rice grass, squirreltail
Brushy Loam	Deciduous Shrub/grass Shrubland	Serviceberry, oak brush, snowberry, mountain brome, slender wheatgrass, western wheatgrass, Letterman and Columbia needle grasses
Clayey Foothills	Grass/Open Shrub Shrubland	Western wheatgrass, mutton grass, Indian rice grass, squirreltail, June grass, Wyoming big sagebrush, black sagebrush
Clayey Salt desert	Salt Desert Shrubland	Gardner saltbush, shadscale, mat saltbush, galleta, Salina wildrye, squirreltail, Indian rice grass
Clayey Slopes	Grassland	Salina wildrye, mutton grass, western wheatgrass, June grass, squirreltail, shadscale
Deep Clay Loam	Grass/Open Shrub Shrubland	Western wheatgrass, slender wheatgrass, mutton grass, squirreltail, June grass, Letterman and Columbia needle grasses, mountain big sagebrush
Deep Loam	Grassland	Bluebunch wheatgrass, muttongrass, needle-and-thread, western wheatgrass, slender wheatgrass, big sagebrush, serviceberry, snowberry.

Ecological Site / Woodland Type	Plant Community Appearance	Predominant Plant Species in the Plant Community
Dry Exposure	Grassland	Beardless bluebunch wheatgrass, needle-and-thread, June grass, Indian rice grass, fringed sage, buckwheat
Foothill Swale	Grass/Open Shrub Shrubland	Basin wildrye, western wheatgrass, slender wheatgrass, streambank wheatgrass, Indian rice grass, Nevada bluegrass, basin big sagebrush, fourwing saltbush, rubber rabbitbrush
Loamy Salt desert	Grass/Salt Desert Shrubland	Needle-and-thread, galleta, Sandberg bluegrass, squirreltail, Indian rice grass, Gardner saltbush, shadscale, winterfat, horsebrush
Loamy Slopes	Mix Shrub/grass Shrubland	Mountain mahogany, bitterbrush, serviceberry, mountain big sagebrush, beardless bluebunch wheatgrass, western wheatgrass, June grass, Indian rice grass
Mountain Loam	Grass/Open Shrub Shrubland	Mountain brome, slender wheatgrass, western wheatgrass, Letterman and Columbia needle grasses, mountain big sagebrush, bitterbrush, low rabbitbrush,
Mountain Swale	Grass/Open Shrub Shrubland	Basin wildrye, slender wheatgrass, western wheatgrass, Letterman and Columbia needle grasses, sedges, rushes, mountain big sagebrush, rubber rabbitbrush, snowberry,
Rolling Loam	Sagebrush/grass Shrubland	Wyoming big sagebrush, winterfat, low rabbitbrush, horsebrush, bitterbrush, western wheat grass, Indian rice grass, squirreltail, June grass, Nevada and Sandberg bluegrass
Salt desert Breaks	Salt Desert Shrubland	Galleta, salina wildrye, squirreltail, Indian rice grass, needle-and-thread, shadscale, winterfat
Salt desert Overflow	Grassland	Alkali sacaton, galleta, Indian ricegrass, squirreltail, sand dropseed, fourwing saltbush, rubber rabbitbrush, greasewood.
Salt Meadow	Grassland	Inland salt grass, western wheatgrass, slender wheatgrass, fourwing saltbush, rubber rabbitbrush
Sandy Salt desert	Grass/Salt Desert Shrubland	Needle-and-thread, Indian rice grass, sand dropseed, Sandberg bluegrass, squirreltail, galleta, shadscale, winterfat, horsebrush
Semidesert Clay Loam	Grass/Sagebrush Shrubland	Western wheatgrass, squirreltail, galleta, Salina wildrye, Indian rice grass, Wyoming big sagebrush, fourwing saltbush, shadscale
Semidesert Loam	Grass/Sagebrush Shrubland	Needle-and-thread, western wheatgrass, galleta, Sandberg bluegrass, squirreltail, Indian rice grass, sand dropseed, Wyoming big sagebrush, fourwing saltbush, winterfat
Stony Foothills	Grass/Open Shrub Shrubland	Beardless bluebunch wheatgrass, western wheatgrass, needle-and-thread, June grass, Indian rice grass, fringed sage, Wyoming big sagebrush, black sage, serviceberry, pinyon and juniper
Stoney Loam	Grass/Shrubland	Bluebunch wheatgrass, Indian ricegrass, needle grasses, muttongrass, western wheatgrass, serviceberry, bitterbrush, bog sagebrush, snowberry
Pinyon/Juniper	Pinyon/Juniper Woodland	Pinyon pine, Utah juniper, mountain mahogany, bitterbrush, serviceberry, Wyoming big sagebrush, beardless bluebunch wheatgrass, western wheatgrass, June grass, Indian rice grass, mutton grass

The following table shows the seral rating used by the BLM to rate rangeland vegetation communities in comparison to the Potential Natural Plant Community (PNC) for a particular ecological site.

ECOLOGICAL SITE SIMILARITY RATINGS	
Seral Rating	% Similarity to the Potential Natural Plant Community (PNC)
Potential Natural community (PNC)	76-100% composition of species in the PNC
Late-Seral	51-75% composition of species in the PNC
Mid-Seral	26-50% composition of species in the PNC
Early-Seral	0-25% composition of species in the PNC

The following tables show an estimate of the public land acreage falling within one of the seral ratings for each ecological site on allotments within the assessment area. These estimates are based upon professional judgments of the Rangeland Management Specialist trained in the use of the rating system. Nearly all ecological sites were visited during the 2004 field seasons for a plant community assessment of the Colorado Public Land Health Standards for each allotment.

Wolf Creek Allotment (06323)						
Ecological Site Similarity Rating						
Ecological Site	Total BLM ACRES	PNC	Late Seral	Mid Seral	Early Seral	BLM Acres Classified
Clayey Foothills	568	374	118	58	18	568
Clayey Saltedserp/Clayey Saltedserp	463	26	124	305	8	463
Clayey Slopes	1425	244	312	616	253	1425
Clayey Slopes/Clayey Slopes	737	402	235	68	32	737
Clayey Slopes/Semidesert Loam	76	35	32	9	0	76
Deep Loam	2087	1443	385	216	43	2087
Deep Loam, Dry Exposure	1499	1189	310	0	0	1499
Deep Loam/Deep Loam	1585	1021	310	185	69	1585
Dry Exposure/Stoney Loam	3240	2907	333	0	0	3240
Dry Mountain Loam/Dry Exposure/Mountain Loam	242	242	0	0	0	242
Foothill Swale	706	0	149	365	192	706
Juniper woodlands/Juniper woodlands	745	N/A	N/A	N/A	N/A	N/A
Loam 10-14	307	240	22	18	27	307
Mountain Loam	233	201	32	0	0	233
Mountain Loam/Deep Loam	102	75	27	0	0	102
Mountain Loam/Dry Exposure	1751	1246	286	185	34	1751
Typic Natrargids	316	0	0	52	264	316
None (Rock outcrop, steep slopes, etc.)	10911	N/A	N/A	N/A	N/A	N/A
PJ woodlands/None	4770	N/A	N/A	N/A	N/A	N/A
PJ woodlands/PJ woodlands	1696	N/A	N/A	N/A	N/A	N/A
PJ woodlands/PJ woodlands/PJ woodlands	2739	N/A	N/A	N/A	N/A	N/A
PJ woodlands/Semidesert SL	407	N/A	N/A	N/A	N/A	N/A
Rolling Loam	2880	1396	896	568	20	2880
Rolling Loam/Clayey Foothills/Sandy Juniper	283	35	112	132	4	283
Saltedserp Overflow	949	70	112	453	314	949
Sandy Foothills	138	125	13	0	0	138
Sandy Loam/Sandy Foothills	5152	4735	302	102	13	5152
SandyFoothills/SandyFoothills/DeepLoam	454	251	183	20	0	454
Stoney Foothills	7789	7013	691	81	4	7789
Total:	54250	23270	4984	3433	1295	32982
% BLM Acres Classified:		71%	15%	10%	4%	

Wolf Creek: As shown within the Wolf Creek allotment, 96% of the ecological sites represent plant communities within acceptable thresholds for healthy communities and within acceptable levels of desired plant communities (mid to PNC) as defined in the White River ROD/RMP.

Vegetation production and species composition on these sites provide adequate cover for soil protection and forage production to meet foraging demands. Many of the allotment's acres are within unclassifiable seral stages such as Pinion/Juniper (PJ) woodlands and Juniper woodlands (10357 acres), and rock outcrops / steep slopes (10911 acres). These acres are generally within an acceptable land health standard status due to the low impact from livestock and/or wildlife use because of their state of lacking natural resources (i.e. forage).

Many acres of the mid/late seral communities have a higher composition of mountain big sagebrush (*Artemisia tridentata*) and encroaching pinion (*Pinus edulis*) and juniper (*Juniperus osteosperma*) (PJ) trees into the sagebrush communities which has resulted over time from grazing influences and lack of fire. In particular, a substantial amount of the rolling loam and deep loam ecological sites have PJ that are approximately 6-10 feet tall and invading into sagebrush dominated landscapes which has resulted from a lack of fire. These communities have adequate production and cover of native species and are not presently at risk of degradation below the threshold of a healthy community nor are they at risk from invasion of non-native species. However, over time the PJ community will continue to invade the sagebrush communities and degrade these sites as the natural plant community shifts.

The early seral communities in the Wolf Creek allotment are primarily valley bottom, valley toe-slope, and/or flats sites which have been degraded from the livestock grazing influences such as historic spring use, feeding practices, and historic bedding of sheep. Historically (prior to 1900), approximately 2,500 cows and /or 150,000 sheep grazed within the confines of the Wolf Creek allotment in any one year (1982 AMP), which caused many of the resource degradations (early seral communities) still apparent today. The majority (769 acres) of these early seral communities lies within the Wolf Creek pasture, adjacent to the Wolf Creek and side drainages that have a presence of cheatgrass (*Bromus tectorum*) in the plant community. In this area, the causative factors for the early seral conditions are spring livestock use, water availability, and historic grazing intensity. Also, 215 acres in the Lower Sandhills pasture (mostly Bear Canyon) are within the early seral category due to the presence of undesirable, invasive, annual plant species (i.e. cheatgrass, tumble mustards (*Thelypodopsis spp.*), Russian thistle (*Sisymbrium spp.*)). In this area, the causative factors for the early seral conditions are grazing intensity, lack of a successful fire reclamation, feeding practices, and water availability on adjacent private lands. Other areas, such as Mud Springs Draw, have early seral communities that are primarily basin big sagebrush (*Artemisia tridentata*) and mountain big sagebrush (*Artemisia tridentata*) drainage bottoms that lack plant diversity within the understory due to a lack of fire, over-domination by sagebrush, and grazing use. Overall, the early seral communities do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock grazing. Prescribed burns and wildfires have occurred on Blue Mountain within the Wolf Creek allotment that have shifted these burn areas from a mountain big sagebrush dominated region to a grass dominated area. These burned sites offer a significant increase in available forage for wildlife and/or livestock. Dominant grasses in burned localities are native species such as needle-and-thread grass (most widespread/dominate) (*Stipa comata*), Indian ricegrass (*Oryzopsis hymenoides*), western wheatgrass (*Agropyron smithii*), and Sandberg bluegrass (*Poa secunda*). Within these burn areas, sagebrush is reestablishing itself within the grass community and will

dominate once again over time. Known areas that have been appreciably impacted by fire include: 1) the northern portion of the Skull Creek Pasture (below Skull Creek Rim), which burned pinyon-juniper woodland and shifted to a needle-and-thread and western wheatgrass community (Box Canyon fire - 1989). 2) Johnson Draw and Serviceberry Draw of the Johnson Draw pasture, which burned a sagebrush community and shifted to a needle-and-thread grass community. 3) Bear Valley and ¼ mile north of Wasson Draw along Moffat County road 95 of the Bear Valley Pasture (mostly private land burns), which burned a sagebrush area and shifted to a needle-and-thread grass community. 4) Disappointment Draw and Badger Flat of the Disappointment Draw pasture, which burned a sagebrush community and shifted toward a needle-and-thread and western wheatgrass community. 5) Sandhills of the Upper and Lower Sandhills pastures burned a sagebrush and bitterbrush (*Purshia tridentata*) community and shifted to a needle-and-thread and Indian ricegrass community.

Previous pinion-juniper (PJ) chainings (Range Improvements (RI) 0911, 1177) that occurred in 1958 (1177) and 1967 (0911) have shifted back towards a PJ dominated region with trees approximately 6-10 feet tall. RI 0911 occurred within the Disappointment Draw, Wolf Creek, and Bear Valley pastures, and RI 1177 occurred within the Wolf Creek pasture. These areas are a PJ woodland ecological site and mostly have shallow/rocky soils that limit production (soil unit – Crago-Pensore-Grapit association, 6-75% slopes). The dominate understory is still the seeded crested wheatgrass (*Agropyron cristatum*), but has diminished its prevalence due to the dense PJ and native grass re-invasion.

Massadona: As shown within the Massadona allotment, 89% of the ecological sites represent plant communities within acceptable thresholds for healthy communities and within acceptable levels of desired plant communities (mid to PNC) as defined in the White River ROD/RMP. Vegetation production and species composition on these sites provide adequate cover for soil protection and forage production to meet various demands.

Massadona Allotment (06324)						
Ecological Site Similarity Rating						
Ecological Site	Total BLM ACRES	PNC	Late Seral	Mid Seral	Early Seral	BLM Acres Classified
Alkaline Slopes	26	3	9	14	0	26
Alkaline Slopes/None	581	61	132	278	110	581
Clayey Foothills	36	9	15	12	0	36
Clayey Saltdesert	910	573	158	119	60	910
Clayey Saltdesert/Clayey Saltdesert	1711	907	540	212	52	1711
Clayey Slopes	1302	117	635	265	285	1302
Clayey Slopes/Clayey Slopes	136	67	48	21	0	136
Clayey Slopes/Semidesert Loam	59	33	15	11	0	59
Claypan	113	68	30	15	0	113
Foothill Swale	206	34	91	72	9	206
None (Rock outcrop, Steep, etc.)	1306	N/A	N/A	N/A	N/A	N/A
Torrifluvents gullied, Typic Natrargids	608	43	240	222	103	608
PJ woodlands/None	188	N/A	N/A	N/A	N/A	N/A

Massadona Allotment (06324)						
Ecological Site Similarity Rating						
Ecological Site	Total BLM ACRES	PNC	Late Seral	Mid Seral	Early Seral	BLM Acres Classified
PJ woodlands/PJ woodlands	756	N/A	N/A	N/A	N/A	N/A
Rolling Loam	150	30	29	15	76	150
Salt desert Overflow	196	6	27	138	25	196
Sandy Loam/Sandy Foothills	1	1	0	0	0	1
Semidesert Loam/Semidesert Loam/Clayey Slopes	46	6	21	19	0	46
Stoney Foothills	74	54	13	7	0	74
Total:	8405	2012	2003	1420	720	6155
% BLM Acres Classified:		33%	33%	23%	11%	

The mid seral to PNC communities are typically located on the hill slopes and ridgelines (clayey salt desert ecological sites) and have a plant community that is tolerant to a high salt and clay content in the soil. These communities are dominated by shadscale (*Atriplex confertifolia*), Gardner saltbush (*Atriplex gardneri*), mat saltbush (*Atriplex corrugate*), and Wyoming sagebrush (*Artemisia tridentata*) to a lesser extent. These salt desert shrublands have an understory comprising mostly of Colorado wildrye (*Elymus salina*), western wheatgrass, and bottlebrush squirreltail (*Sitanion hystrix*).

The early seral communities in the Massadona allotment are primarily valley bottom, valley toe-slope, and/or flats sites which have been degraded from livestock grazing influences such as spring use, historic feeding practices, previous grazing intensity, and historic bedding of sheep. In the south pasture, these early seral types are typically low precipitation salt desert shrub communities dominated by shrubs (shadscale, mat saltbush, Gardner saltbush, sagebrush, etc), with an understory of cheatgrass, western wheatgrass, bottlebrush squirreltail, and invasive forbs. They typically occur within the historic floodplains and the heavy soil terraces of Box Elder Creek and Divide Creek, and within general lowland localities. In the north pasture, the early seral communities (cheatgrass) are typically a sagebrush foothills community. The early seral areas in the north pasture are a result of historic feeding practices as evident from discarded bailing wire and a hayshed. Overall, the early seral communities do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock grazing.

This salt desert shrub community has been particularly impacted by recent drought which has caused extremely low vigor within the native Colorado wildrye and western wheatgrass communities, with approximately 50-85% of these grasses experiencing varying degrees of decadence with intermixed mortality. For example, the bunch grasses have experienced partial or complete die-off that left remnant soil pedestals.

Horse Draw: As shown within the Horse Draw allotment, 90% of the ecological sites represent plant communities within acceptable thresholds for healthy communities and within acceptable levels of desired plant communities (mid to PNC) as defined in the White River ROD/RMP.

Vegetation production and species composition on these sites provide adequate cover for soil protection and forage production to meet foraging demands.

Horse Draw Allotment (06332)						
Ecological Site Similarity Rating						
Ecological Site	Total BLM ACRES	PNC	Late Seral	Mid Seral	Early Seral	BLM Acres Classified
Alkaline Slopes	74	0	5	27	42	74
Alkaline Slopes/None	48	0	1	1	46	48
Clayey Saltdesert	179	16	15	72	76	179
Clayey Saltdesert/Clayey Saltdesert	5467	2151	2397	651	268	5467
Clayey Slopes	3682	831	1946	612	293	3682
Clayey Slopes/Clayey Slopes	8	0	3	5	0	8
Clayey Slopes/Semidesert Loam	1089	327	311	425	26	1089
Foothill Swale	343	78	88	65	112	343
Torrifluvents gullied, Typic Natrargids	672	0	0	413	345	758
Saltdesert Breaks	17	0	0	5	12	17
Saltdesert Overflow	191	0	8	60	123	191
Semidesert Loam/Clayey Slopes	436	206	104	126	0	436
Stoney Foothills	361	184	132	45	0	361
Total:	12566	3793	5010	2507	1343	12653
% BLM Acres Classified:		30%	40%	20%	10%	

The mid seral to PNC communities are typically located on the hillslopes and ridgelines (clayey saltdesert ecological sites) and have a plant community that is tolerant to a high salt and clay content in the soil. These communities are dominated by shadscale, garnder saltbush, mat saltbush, and sagebrush to a lesser extent. These salt desert shrublands have an understory comprising mostly of Colorado wildrye, western wheatgrass, and bottlebrush squirreltail.

The early seral communities in the Horse Draw allotment are primarily valley bottom, valley toe-slope, and/or flats sites which have been degraded from the influences from livestock grazing such as spring use, historic feeding practices, trailing of sheep, previous grazing intensity, and historic bedding of sheep. These early seral types are typically low precipitation salt desert shrub communities dominated by shrubs (shadscale, mat saltbush, Gardner saltbush, sagebrush, etc), with an understory of cheatgrass, western wheatgrass, bottlebrush squirreltail, and invasive forbs. They typically occur within the historic floodplains and the heavy soil terraces of Wolf Creek and the Middle Fork of Wolf Creek. Also, it appears that historic trailing of sheep along the Victory trail, which traverses along the northern boundary, has impacted the rangelands at potential watering and overnight localities. Overall, the early seral communities do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock grazing.

This salt desert shrub community has been particularly impacted by recent drought which has caused extremely low vigor within the native Colorado wildrye and western wheatgrass communities, with approximately 50-85% of these grasses experiencing varying degrees of decadence with intermixed mortality. For example, the bunch grasses have experienced partial or complete die-off that left remnant soil pedestals.

Hall Draw: As shown within the Hall Draw allotment, 84% of the ecological sites represent plant communities within acceptable thresholds for healthy communities and within acceptable levels of desired plant communities (mid to PNC) as defined in the White River ROD/RMP.

Vegetation production and species composition on these sites provide adequate cover for soil protection and forage production to meet foraging demands.

Hall Draw Allotment (06335)						
Ecological Site Similarity Rating						
Ecological Site	Total BLM ACRES	PNC	Late Seral	Mid Seral	Early Seral	BLM Acres Classified
Alkaline Slopes	737	48	234	187	268	737
Alkaline Slopes/None	1	0	1	0	0	1
Clayey Slopes	84	9	35	40	0	84
Loamy Salt desert/Sandy Salt desert	210	22	76	84	28	210
None (Rock Outcrop/Steep Slopes)	3293	N/A	N/A	N/A	N/A	N/A
Torrifluvents, gullied	164	0	0	134	30	164
PJ woodland/Rolling Loam	1049	341	527	127	54	1049
PJ woodlands/PJ woodlands	70	N/A	N/A	N/A	N/A	N/A
Rolling Loam	503	0	292	23	188	503
Salt desert Breaks	339	37	145	150	7	339
Sandy Salt desert	2	0	0	2	0	2
Stoney Foothills	526	98	292	136	0	526
Total:	6978	555	1602	883	575	3615
% BLM Acres Classified:		15%	44%	25%	16%	

The mid seral communities have a higher composition of Wyoming big sagebrush which has resulted over time from grazing influences and lack of fire. These communities have adequate production and cover of native species and are not presently at risk of degradation below the threshold of a healthy community nor at risk from invasion of non-native species.

The early seral communities are primarily valley bottom, valley toe-slope, and/or flats sites which have been degraded from the historical influences from livestock grazing such as historic spring use, feeding practices, and bedding of sheep. A part of the early seral acres are associated with a wild fire that occurred south of Bob Cat Reservoir that has experienced limited success in establishment of desired plant communities. Also, the Hall Draw and Villard Flats areas have a Wyoming big sagebrush community whose understory is dominated by cheatgrass. In these areas, cheatgrass consist of approximately 60-90% of the grass component. The early seral communities do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, these early seral areas have crossed a threshold

of cheatgrass domination whose condition would not significantly change with or without livestock grazing.

This Hall Draw area has been particularly impacted by recent drought which has caused extremely low vigor within the sagebrush community, with approximately 60-75% of the sagebrush experiencing varying degrees of decadence with intermixed mortality.

INVASIVE, NON-NATIVE SPECIES

Noxious weeds known to occur in the study area are Russian knapweed (*Acroptilon repens*), musk thistle (*Carduus nutans*), and perennial pepperweed (*Lepidium latifolium*, Tall Whitetop). These species all occur within the Wolf Creek allotment and musk thistle, bull thistle (*Cirsium vulgare*), perennial pepperweed also occur on the Massadona allotment. Within the Horse Draw allotment, Perennial pepperweed is found in the Horse Draw allotments within the Wolf Creek drainage and a Russian knapweed patch occurs along BLM road 1506.

Russian knapweed occurs at two known locations adjacent to county roads on the Wolf Creek allotment. One location is along Moffat County Rd 16 from the west boundary of the Wolf Creek allotment for about 3/8 miles east. This infestation has been treated multiple times over the past ten years and has been reduced to less than 0.2 acres. The other location occurs adjacent to Mantle Ranch road (Moffat County Rd 95) in T5N, R100W, SENW Sec 4. This infestation has been treated several times and is less than 0.1 acres. On the Wolf Creek allotment, musk thistle is not known to occur on any BLM lands, although it does occur on private lands in Bear Valley (T5N R101W Sec 2).

Within the Horse Draw allotment, a small patch of less than 0.1 acres of Russian knapweed occurs within the disturbance of BLM road 1506 (T3N, R99W, Sec. 18, SE). This small infestation was discovered in 2005 and was sequentially treated.

Perennial pepperweed occurs around and below Peterson Draw Reservoir #1 (#0821) (T4N, R100W NWSE Sec 23), down the draw to its confluence with Wolf Creek, and down the Wolf Creek drainage. The estimated acreage of infestation is 10 acres. Also, perennial pepperweed occurs on the Massadona allotment at Divide Creek Detention Dam (#1151) (T3N, R100W SESW Sec 13). This small infection (less than 1 acre) was treated in the past for several years to an insignificant plant population level.

The invasive alien cheatgrass (*Bromus tectorum*) occurs on a variety of ecological sites throughout the permit renewal area. In general its occurrence and distribution is a consequence of historical livestock grazing practices and un-revegetated soil disturbance associated with roads and mechanical equipment. Cheatgrass has the greatest influence within the lower elevation allotments of Massadona, Horse Draw, and Hall Draw.

On the Wolf Creek allotment (06323), of the 1295 acres listed as not meeting the Standards, approximately 984 acres or 76%, have sufficient cheatgrass in the plant composition and insufficient desirable perennial species that it is concluded that these sites have crossed a

threshold which is irreversible regardless of livestock grazing management. For the other allotments within the study area, Hall Draw, Massadona and Horse Draw, the acreages listed as not meeting the Standards for those respective allotments (575, 720 and 1343 acres) are predominately sites where cheatgrass is a dominant component of the plant composition.

Three Springs Ranch (grazing permittee) is an essential participant in the detection and eradication of noxious weeds on BLM and private lands within the study area. The ranch is typically the first line of defense in the long-term endeavor of controlling noxious weeds.

THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES

A Colorado BLM sensitive plant species occurs near the Horse Draw pasture, the Debris Milkvetch (*Astragalus detritalis*). Debris Milkvetch is a rare milkvetch which occurs from near Meeker, into northeastern Utah. Populations are also known from the Rangely area. The plant flowers in May. There does not appear to be a geological substrate with which it is intimately associated, as it occurs on rocky or sandy soils on alluvial terraces with cobbles. The debris milkvetch occurs on some of the alluvial terraces that are within a mile wide corridor of Hwy 40 between Massadona to the west and Wolf Creek to the east. Nearly all of the known populations of the Debris Milkvetch occur immediately south of Hwy 40 on terraces and adjoining slopes covered with small cobbles. This plant occurs on steep west facing slope of School Gulch in an area of less than 40 acres and at elevation ranges from 5400-7200 ft.

There is no reasonable likelihood that current land management activities would have an influence on the condition or function of Threatened, Endangered, or Sensitive plant species. Thus there would be no effect on achieving the land health standard.

THREATENED, ENDANGERED, AND SENSITIVE ANIMAL SPECIES

White-tailed prairie dogs, a BLM sensitive species, are distributed widely across lower elevation salt desert ranges that make up much of the study area south of U.S. 40. Prairie dogs occupy valleys and basins with low or sparse woody cover in greatest abundance, and are typically associated with vegetation types and range sites that are heavily represented by annual grasses (e.g., cheatgrass) and forbs. Prairie dog abundance is strongly influenced by disease (e.g., sylvatic plague, tularemia) and populations tend to fluctuate dramatically. Over the last 30 years, prairie dogs have occupied up to 15,100 acres or nearly 60% of the permit's low elevation shrubland types.

The heaviest concentrations of prairie dogs tend to coincide with range sites rated in early seral condition. Virtually all these prairie dog populations are monitored annually as part of black-footed ferret recovery efforts. Prairie dog population indices on this town remained relatively constant in 2003 and 2004, and nearly doubled in 2005. Current populations are about 70% of the highest recorded populations of 1993/94. Although prairie dogs can appear above ground sparingly during the winter months, most begin to emerge from hibernation by early March, with young appearing above ground by late May. Although intuitive that availability of higher quality

and increased quantities of vegetation as forage would figure prominently in the ultimate survival and/or reproductive ability of white-tailed prairie dogs, there is little to suggest that the current forage base or the prevailing use of that forage by potential competitors is suppressing prairie dog abundance or reproductive capacity in the lower Wolf Creek basin.

Prairie dogs and their burrow systems are important habitat components of burrowing owl (a State threatened species), ferruginous hawks (BLM sensitive species) and reintroduced populations of black-footed ferret. Herbaceous growth and residuals (that herbaceous material remaining after the grazing period) serve as forage and/or a cover base for all breeding nongame and small game animals, non-hibernating small mammals (e.g., voles) and ground nesting birds (e.g., horned larks), all of which may serve as prey to special status populations of raptors and ferrets.

Under the auspices of a non-essential, experimental population rule, black-footed ferret recovery was initiated in northwest Colorado and northeast Utah in 1999. Since 2001, ferrets have been released annually in the designated Wolf Creek Ferret Management Area (WCMA) that straddles the US 40 corridor in lower Wolf Creek basin. Three allotment pastures are integral with the WCMA, including: Massadona South, Horse Draw, and Wolf Creek. Ferrets breed in February and March with parturition in mid- to late-May. Kits emerge from natal burrows in mid-July.

Burrowing owls are uncommon in this Resource Area. These birds return to occupy a prairie dog burrow system in early April and begin nesting soon afterward. Young birds are normally fledged by late July with family groups remaining together through September, when the birds leave for southern wintering grounds. BLM has a number of historical records of burrowing owl nests in the lower Wolf Creek basin.

Ferruginous hawks are uncommon breeding species and are closely associated with prairie dog distribution in this Resource Area. Nest sites are well distributed across the lower elevation shrublands north of the White River. Approximately 9 ferruginous hawk territories involving 44 natural and constructed platform nest sites are encompassed by this permit. These hawks return to these ranges in late February and begin nesting (egg-laying) by early to mid April. Incubation continues through late May with fledging of young by late July. Breeding populations of these hawks vary in direct relation to the prairie dog, cottontail, and jackrabbit prey base.

Bald eagles forage extensively across these lower elevation shrublands during the winter months from roost sites along the lower White River. Their use of these areas is regular, but dispersed and opportunistic. The Hall Draw pasture encompasses a total of 0.5 mile of the White River in 3 small reaches. With the exception of 0.15 mile, these parcels subtend cliff-like bluffs and are effectively isolated from livestock access. The remaining parcel is situated on a greasewood-dominated alluvial fan on the outside curve of a meander. The banks of this reach are vertically incised and bear no riparian expression. None of the parcels support cottonwood trees nor are they amenable to the development of a cottonwood gallery stand (i.e., widest floodplain width about 55 feet) that would be capable of serving eagle roost or nest functions.

The northern and western pastures of the Three Springs permit encompass about one-third of the sage-steppe habitats associated with the Blue Mountain greater sage-grouse population.

Although this population is isolated from the expansive Moffat County populations, this population is the largest and most productive in the White River Resource Area. Most of the breeding and nest activities occur in the mid-elevation basins of Turner and Wolf Creeks on the western end of the permit area (about 62% privately owned). Eleven strutting grounds have been located within the permit, the largest and more significant (2) located on private lands in upper Wolf Creek. Broods gradually disperse and drift to higher elevations and, as a result, nearly all the higher elevation sagebrush habitats north and west of the Lower Sandhills pasture function as brood range (collectively about 65% privately owned). Blue Mountain's capacity for strong production and recruitment is largely attributable to an abundance of wet meadow habitats and higher elevation mountain big sagebrush communities with well developed herbaceous understories. Reports of large number of bird on windswept ridges on the south rim of the Yampa Canyon may account for a large share of wintering birds, but several hundreds appear to follow the Wolf Creek drainage and winter on the lower-elevation pastures within the permit. Sage-grouse begin nesting in mid-April with hatching taking place from late May through early July. Grouse locate nests beneath sagebrush canopies. Marked increases in nest success are attributable to nest sites where surrounding herbaceous growth provides supplemental cover of at least 7-inch height and 15% canopy. Chicks are able to travel immediately after hatch, fly strongly by 5 weeks (by early August), and become independent of the hen in 10-12 weeks (by early September). Invertebrates and select forbs form the important constituents of sage-grouse diets during the nest and brood periods.

A small number of greater sage-grouse strut, nest, and raise broods in the lower Wolf Creek basin. Although these arid salt-desert shrublands are not normally considered suitable sage-grouse summer habitat, a population of several 10's of birds persists nonetheless. These birds tend to congregate in the deep incised drainages of Wolf Creek later in the summer where, presumably, shade and succulent broadleaf vegetation and invertebrates are more easily procured. Most of the study area's leks (8) occur at these lower elevations, many of these being abandoned or alternate lek locations. These leks typically hold less than 10 roosters. In contrast, several hundred sage-grouse winter in the Wolf Creek basin's scattered Wyoming big sagebrush habitats, the birds tending to concentrate from the mainstem of Wolf Creek east to Pinyon Ridge (encompassing the Horse Draw allotment). These birds apparently originate from the upper elevations of Wolf Creek on Blue Mountain, 10 and more miles upstream.

MIGRATORY BIRDS:

This extensive study area spans an array of elevations and vegetation communities that support a wide variety of migratory birds during the nesting season (early May through mid July). Four lower elevation pastures (Wolf Creek, Massadona, Horse Draw, Hall Draw) are represented primarily by salt desert communities dominated by prostrate saltbush (~10,250 acres), sagebrush-shadscale (~14,000 acres), and greasewood-basin big sagebrush (~2,900 acres) shrublands. Birds of higher conservation interest (i.e., Partners in Flight program) associated with these habitats and well represented in the permit area include: Brewer's sparrow, sage sparrow, horned lark, and loggerhead shrike. Loggerhead shrike are regular, but low density breeding species that nest in greasewood and basin big sagebrush stands, especially in the broad incised drainages throughout the lower Wolf Creek basin. The sparrows are widely distributed

and abundant throughout the arid sagebrush and saltbush communities, whereas the lark is common and found on barren annual bottomlands or mat saltbush ridges. About 15,000 acres of pinyon-juniper and juniper-dominated woodlands are widely distributed in the northeast (Disappointment and Bear Valley), central (Skull Creek Basin and Rim), and southern margin (Hall Draw) of the permit area. With the exception of the Skull Creek Basin (Skull Creek pasture), these lower elevation woodlands do not occur as extensive tracts and much has been subjected to wildfire and mechanical treatments (Bear Valley 1950s vintage chainings). Due to site characteristics, these woodlands are generally stunted, possess poorly developed understories, and typically do not support the full complement or abundance of woodland associates found south of the White River. Higher conservation species represented in the permit area include: gray flycatcher, pinyon jay, juniper titmouse, and black-throated gray warbler. It is likely that gray vireo, a rather narrowly distributed species in northwest Colorado, appears at least sparingly in juniper habitats in the Skull Creek Basin and on Coal Ridge. These areas are well north of core distributions south of the White River near Rangely. Gray vireo have only been recorded once (1991) on a Breeding Bird Survey route that bisects much of the study area north of Highway 40. The majority of habitats north of Highway 40 consist of extensive big sagebrush (higher elevation Wyoming and mountain subspecies) and mixed shrub (primarily antelope bitterbrush and Utah serviceberry) shrublands (~42,300 acres). Birds of higher conservation interest associated with these extensive higher-elevation sage-steppe habitats, Brewer's sparrow and green-tailed towhee, are abundant and widespread on these ranges.

WILDLIFE, TERRESTRIAL

The study area spans ranges used year-round by deer, elk, and pronghorn. The northwest quadrant of the project area, particularly those habitats associated with higher elevation mixed and mountain shrub communities, is occupied by mule deer and elk from April through December. The Colorado Division of Wildlife manages the encompassing big game management unit for trophy deer and elk, which substantially limits the number of hunters and harvest occurring in the project area. Elk populations are considerably higher than the State's herd objective and are the most conspicuous big game species in the project area. Based on CDOW modeling, deer populations are thought to approximate herd objectives, but contradictory observations by field staff indicate populations are substantially lower. This situation has likely been aggravated by years of serious drought, but is not convincingly attributable to forage conditions. Pervasive use of the area by large numbers of elk may be adversely affecting deers' ability to make efficient use of mutually preferred cover and forage resources.

The project area's lower elevation salt-desert, big sagebrush, and juniper woodland ranges are used by deer and elk during the winter and early spring months (October through early May). Deer use is light and is associated primarily with seasonal movements in the Horse Draw allotment. Interspersed woodland cover and terrain in the Red Wash allotment allow for the support of sustained winter deer use. Heavy elk use, beginning in mid-December, has become prevalent in the southern and northeast sections of the project area over the past 15 years. Pronghorn use these ranges throughout the year, but lacking reliable water sources; summer use is generally limited and dispersed. Although up to 150 pronghorn wintered in the vicinity of the

Horse Draw allotment in the early 1990s, northwest Colorado has undergone unexplained declines in pronghorn populations, and today the area winters no more than half this number.

Breeding raptor use of project area is represented largely by cliff-nesting golden eagle and red-tailed hawk. Ferruginous hawk and burrowing owl are relegated to the salt-desert community in the project area's southeast quadrant (see discussion in Status Species above). Juniper woodlands throughout the project area likely supports a small number of breeding Cooper's hawk and long-eared owl. The abundance and variety of raptor use in the lower half of the project area remains high during the winter, with opportunistic foraging by golden and bald eagle, rough-legged and red-tailed hawk, and prairie falcon.

Nongame bird and small mammal populations associated with the project area are typically common and broadly distributed in extensive shrubland and woodland communities found throughout the Resource Area (as well as the Great Basin). The abundance and distribution of non-game bird populations, in particular, are believed to be appropriate with no notable lapses or inconsistencies in potential expression.

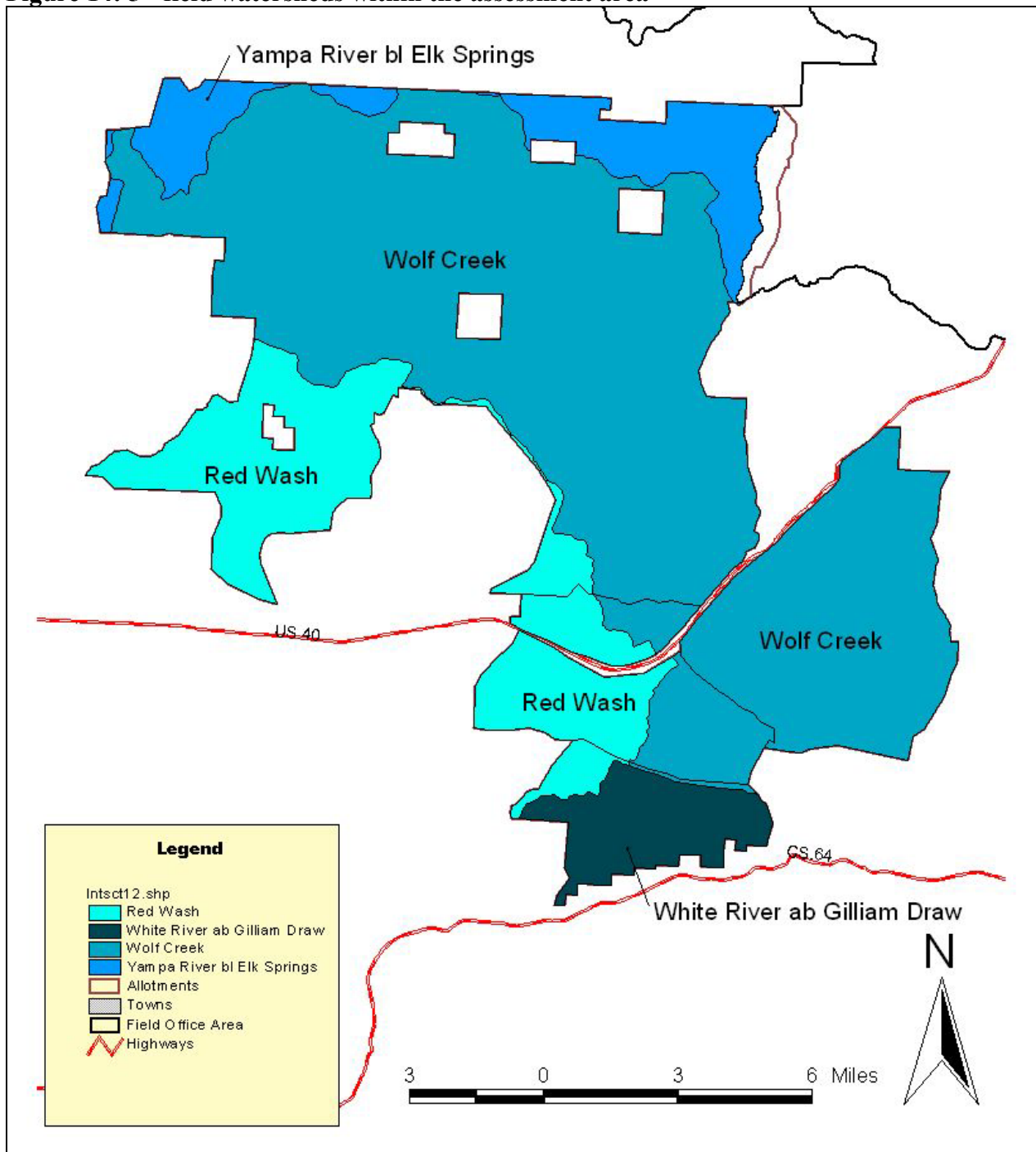
WATER QUALITY

The table below identifies the drainages that occur within the allotment boundaries, the watershed the drainage is a tributary to, corresponding amount of acres in each of the drainages, and the water quality stream segment each of the drainages fall into.

Major Drainages	Acres within Assessment Area	QW Stream Segment
White River Watershed		
Hall Draw	2,100	13a
Wolf Creek	75,400	
Red Wash	17,400	
White River	3,500	12
Yampa River Watershed		
Disappointment Draw	4,800	14
Johnson Canyon	2,516	
Bear Draw	560	
Hells Canyon	325	
Thanksgiving Gorge	1,200	
Yampa River	30	
Total Acres	107,831	

Fifth field watersheds within the assessment area (see figure 14) are continuous and include Wolf Creek (HUC: 1405000701), Red Wash (HUC: 1405000703), Yampa River (HUC: 1405000204), White River (HUC: 1405000702). Figure 15 illustrates 6th and 7th field watersheds areas within the assessment area.

Figure 14: 5th field watersheds within the assessment area



The assessment area is situated in stream segments 12 and 13a of the White River Basin as well as in stream segment 14 of the Yampa River Basin. A review of the Colorado's 1989 Nonpoint Source Assessment Report (plus updates), the 305(b) report, the 303(d) list, the White River Resource Area RMP, and the Unified Watershed Assessment was done to see if any water quality concerns have been identified. It should be noted that the White River ROD/RMP has identified approximately 10 miles of Wolf Creek below highway 40 (Horse Draw Allotment) as

not meeting Public Land Health Standard #5 for suspended sediment and salinity. In addition, a majority of the upper tributaries to Red Wash and Wolf Creek are ephemeral and do not meet the standards during periods of flow. Furthermore, both Red Wash and Wolf Creek are listed on the states Monitoring and Evaluation List (M&E List) for suspended sediment and salinity. Currently the White and Yampa Rivers meet the Public Land Health Standards.

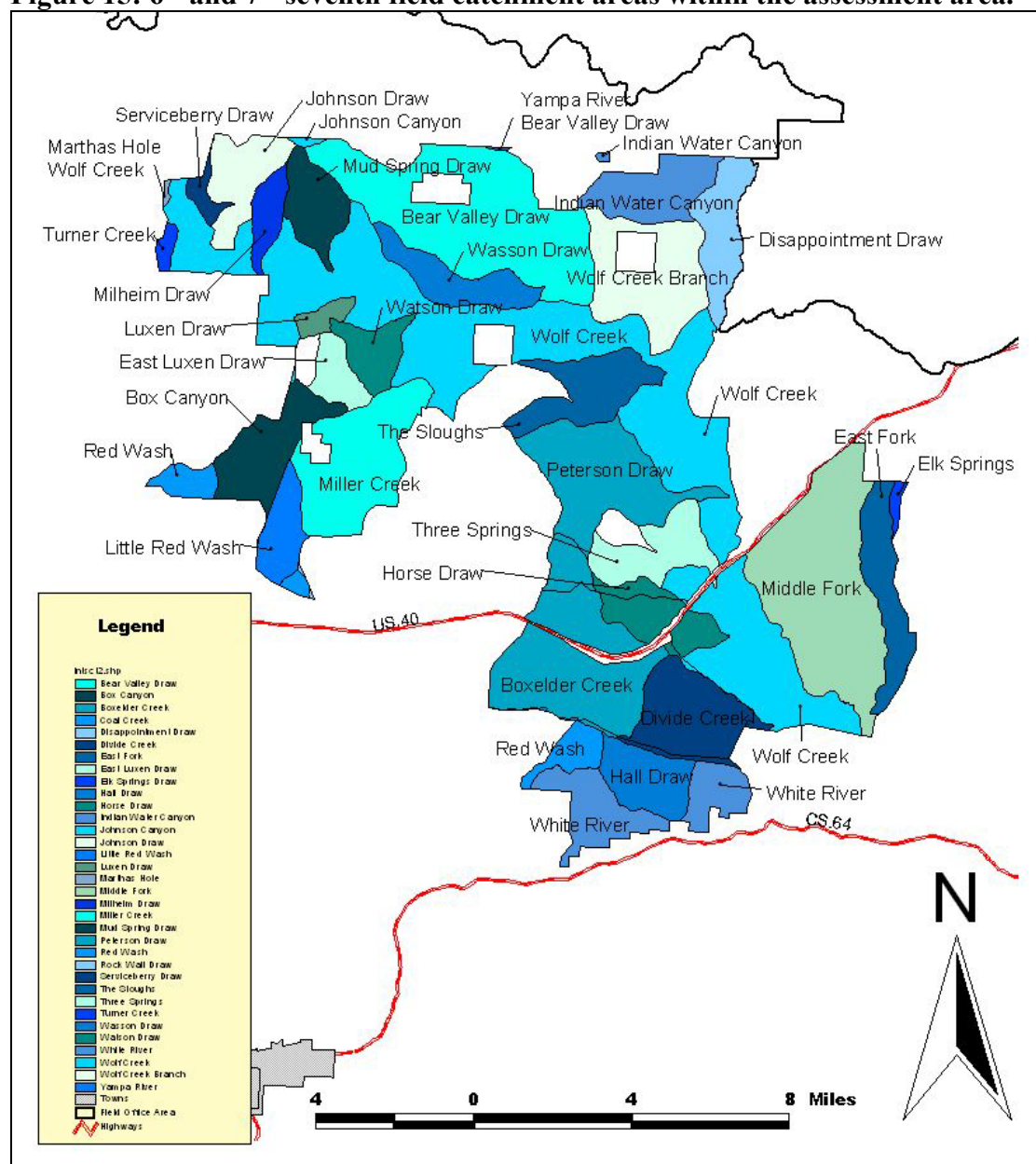
Stream segment 12 of the White River Basin includes the main stem of the White River from a point immediately above the confluence with Piceance Creek to a point immediately above the confluence with Douglas Creek including Taylor Draw Reservoir. Approximately 3% of the assessment area is located within stream segment 12. Stream segment 12 has NOT been designated as "Use Protected" thus, the anti-degradation rule applies to this segment meaning no further water quality degradation is allowable that would interfere with or become harmful to the designated uses. The state has classified stream segment 12 as being beneficial for the following uses: Warm Aquatic Life 1, Recreation 1a, water supply, and Agriculture.

Stream segment 13a includes all tributaries to the White River, including all wetlands, lakes and reservoirs from a point immediately above the confluence with Piceance Creek to a point immediately above the confluence with Douglas Creek. The majority of the assessment area (approximately 88%) falls within stream segment 13a of the White River Basin. Major drainages (5th field watersheds) within segment 13a of the assessment area include the Wolf Creek, and Red Wash catchments areas. It should be noted that both Red Wash and Wolf Creek have been listed on the states Monitoring and Evaluation list (M&E List) for suspended sediment and salinity impairments. The State has classified stream segment 13a as "Use Protected". Stream segment 13a has been further designated by the state as being beneficial for the following uses: Warm Aquatic Life 2, Recreation 2, and Agriculture. This segment retained its Recreation Class 2 designation after sufficient evidence was received that a Recreation Class 1a use was unattainable. The antidegradation review requirements in the Antidegradation Rule are NOT applicable to waters designated use-protected. For those waters, only the protection specified in each reach will apply. For stream segment 13a, minimum standards for four parameters have been listed. These parameters are: dissolved oxygen = 5.0 mg/l, pH = 6.5 - 9.0, Fecal Coliform = 2000/100 ml, and 630/100 ml E. coli.

Stream segment 14 of the Lower Yampa/Green River Basin includes all tributaries to the Yampa River including all wetlands, lakes, and reservoirs from a point immediately below the confluence with Lay Creek to a point immediately below the confluence with the Little Snake River. Approximately 9% of the assessment area is located within stream segment 14 of the Lower Yampa/Green River Basin. Major drainages (6th and 7th field watersheds) within segment 14 of the assessment area include the Disappointment Draw, Johnson Canyon, Bear Draw, Hells Canyon, and Thanksgiving Gorge catchment areas. The State has classified stream segment 14 as "Use Protected". Stream segment 14 has been further designated by the state as being beneficial for the following uses: Warm Aquatic Life 2, Recreation 2, and Agriculture. This segment retained its Recreation Class 2 designation after sufficient evidence was received that a Recreation Class 1a use was unattainable. The antidegradation review requirements in the Antidegradation Rule are NOT applicable to waters designated use-protected. For those waters, only the protection specified in each reach will apply. For stream segment 14, minimum

standards for four parameters have been listed. These parameters are: dissolved oxygen = 5.0 mg/l, pH = 6.5 - 9.0, Fecal Coliform = 2000/100 ml, and 630/100 ml E. coli.

Figure 15: 6th and 7th seventh field catchment areas within the assessment area.



The majority of stream reaches within the assessment area are ephemeral in nature and flow in direct response to high intensity precipitation events and snow melt. Perennial reaches are limited to spring fed channels located high in the drainage basin (such as Bear Canyon) and to the head waters of the main stem of Wolf Creek (private lands).

High runoff generally occurs from mid-March through mid-June and is caused primarily by melting of the higher elevation snowpack. Transitional months are usually March and July. Early season runoff is generally from lower elevation snowmelt and may provide a separate and lower

discharge peak than the main peak in the hydrograph, which usually occurs in late May and early June.

Water from the higher mountain runoff contains lower concentrations of salts with calcium bicarbonate predominating. As water moves through the lower reaches of the system, the major constituents typically change from calcium bicarbonate to calcium sulfate, sodium sulfate, and sodium chloride. This shift is influenced by factors such as (a) a change in the salinity of the alluvial material that water contacts, (b) the chemical makeup of soils and geologic formations contributing surface runoff and groundwater, and (c) the relative cation-anion exchange activity between salt producing ions. Sodium and chloride are the most active ions and tend to replace or exchange with other elements in solution.

Numerous stock ponds and reservoirs/sediment retention structures exist within the assessment area (see figures 16 and 17). Most of these structures are located within the Massadona (06324) (T3N, R100W, Sections 16, 17, 18) and Hall Draw (06335) allotments (T3N, R100W, Sections 26, 27, 28, 29, 35, & 36). In 2004, 61 new erosion control structures were constructed and 9 existing earthen dams were maintained.

Figure 16: Sediment retention structures within the Massadona (06324) and Hall Draw (06335) allotments.

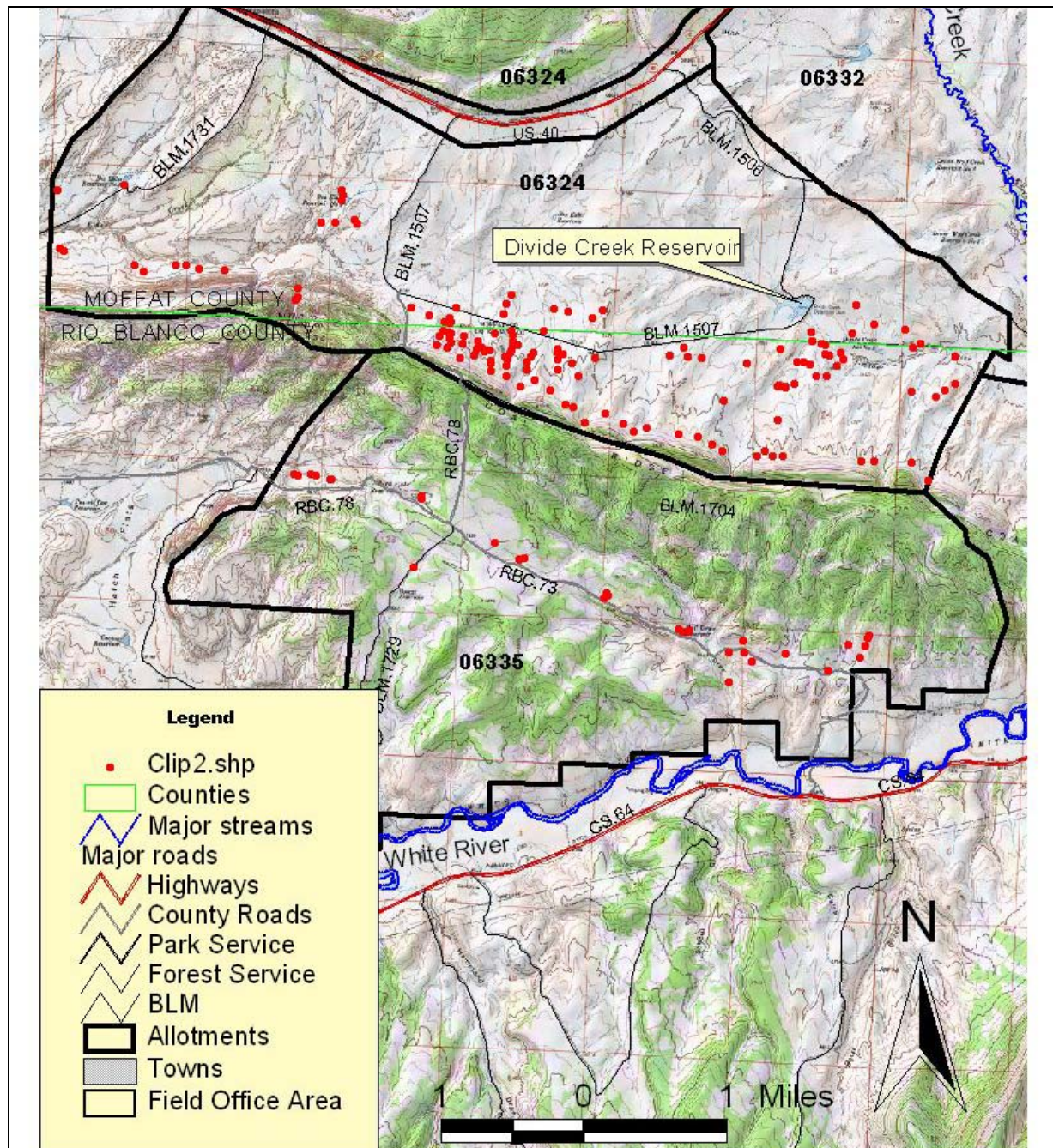
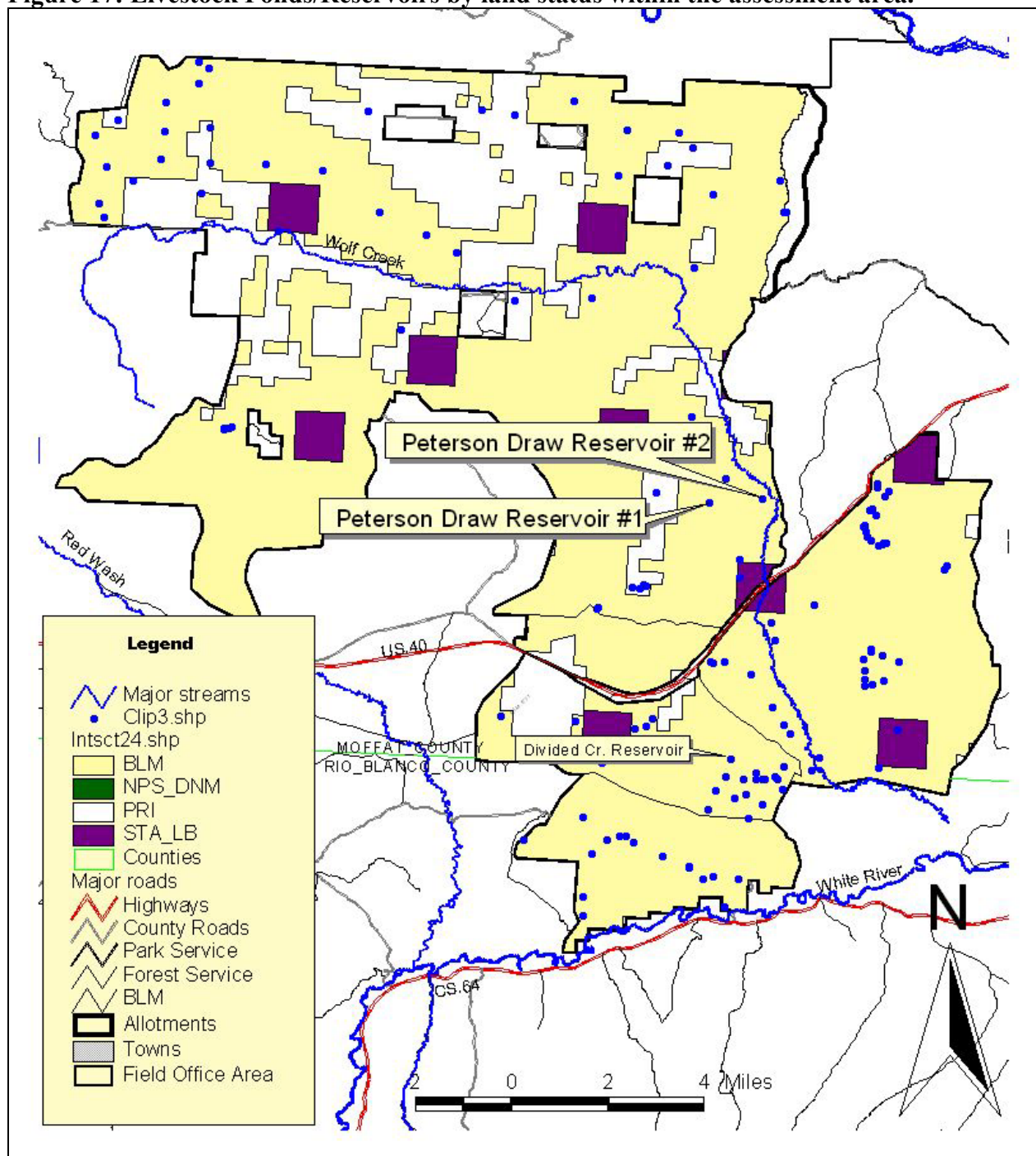


Figure 17: Livestock Ponds/Reservoirs by land status within the assessment area.



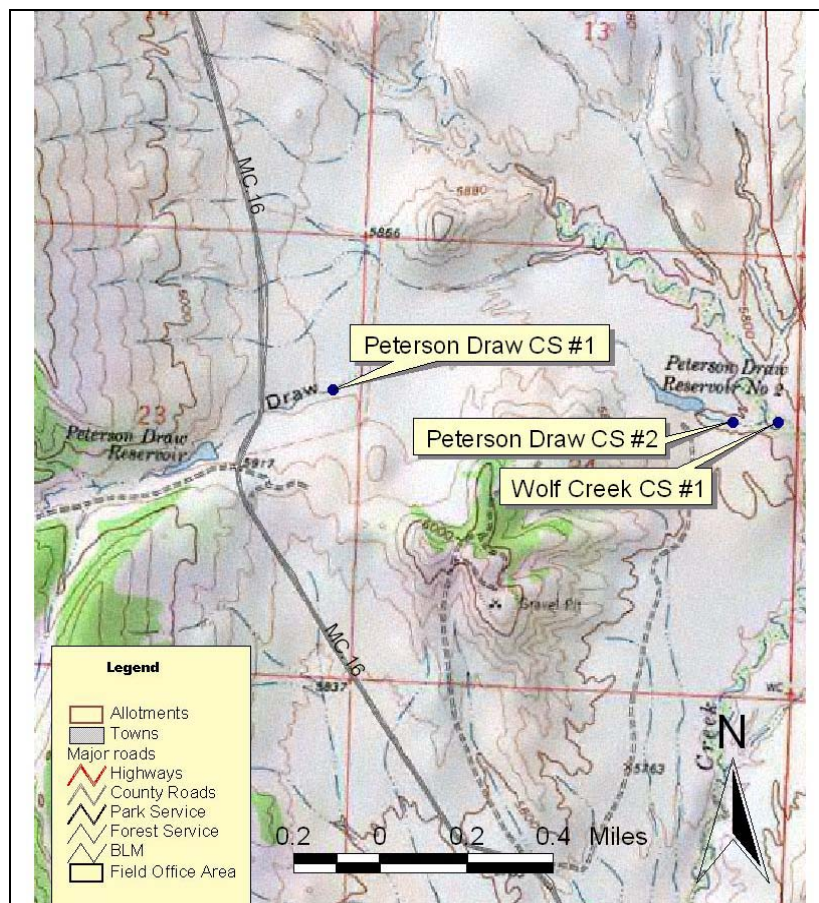
Sediment dams were identified as recommended treatment methods in the Lower Wolf Creek Watershed Management Plan (WMP) to help achieve the plans' objectives. Those objectives include reduction of salt loads within the Colorado River System by retaining high saline soils within the upper watersheds. A significant portion of the project area occurs within the Mancos Shale Uplands, which are identified as Treatment Area 1 in the WMP. Treatment Area 1 has the

highest ranking for applying recommended treatment methods and greatest potential for decreasing salt contribution into off site stream systems.

Sediment production from the project area is estimated at 5 to 12 tons per acre per year with some areas producing as much as 20 tons per acre per year. It is estimated that the erosion control structures retain sediments produced from nearly 1,000 acres. The result is an estimated 6,300 to 15,120 tons of sediment retained in the uplands annually and decreased salt content within the sediment loads that would otherwise be transported into the White River and eventually the Colorado River System.

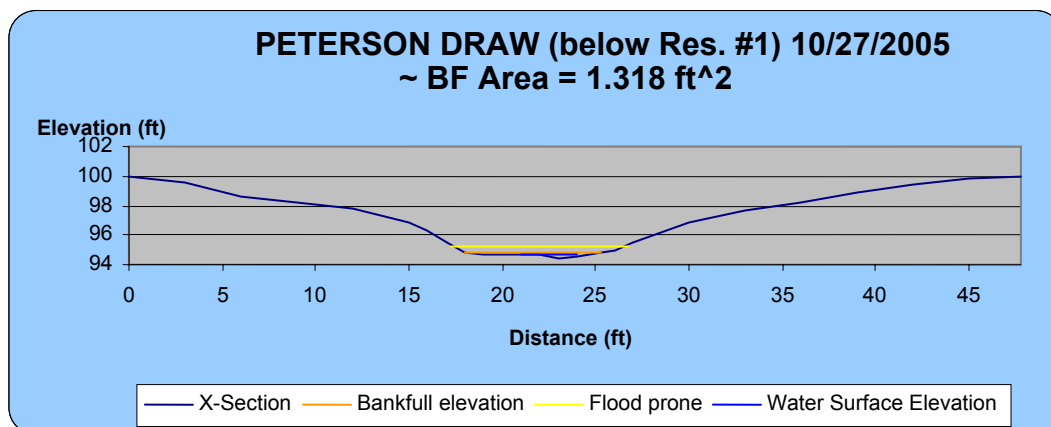
Cross sectional data was collected in the fall of 2005 below each of the Peterson Draw reservoirs to assess the morphologic impact of sediment retention structures (figure 18).

Figure 18: Stream cross section locations within the Wolf Creek allotment



Cross sectional data was also collected in Wolf Creek down stream of the Peterson Draw confluence. The following graphs and photos (see Figures 19-27) illustrate the morphologic condition at each location. Note, due to the ephemeral nature of the stream reaches surveyed in Wolf Creek (figure 25) and below Peterson Draw #2 (figure 22) bankfull elevations and floodprone widths are only estimates of the systems transitioning morphologic condition.

Figure 19: Cross sectional profile below Peterson Draw Reservoir #1



Peterson Draw (below Reservoir #1) 10/2005

Figure 20: Looking US at cross section



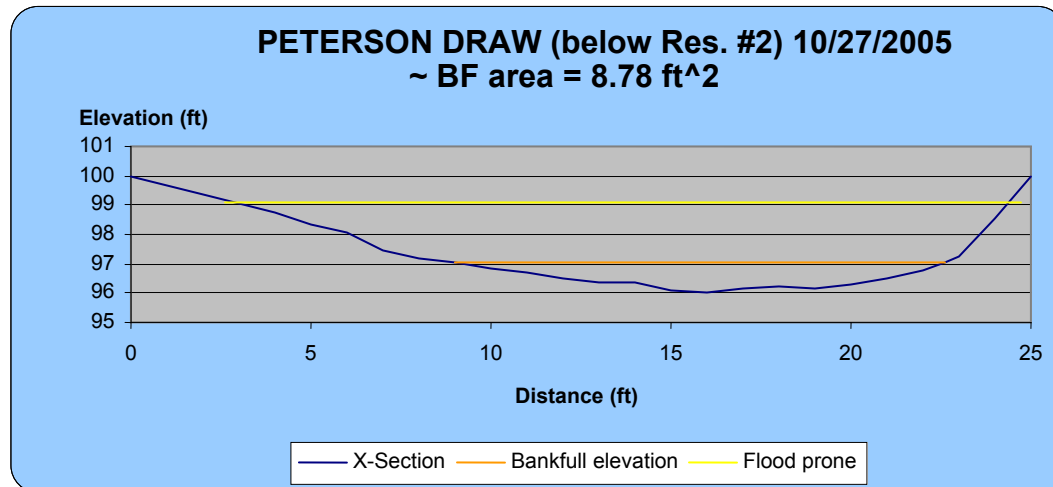
Figure 21: Looking DS at cross section



Flow in Peterson Draw is primarily controlled by perennial springs located on private lands near the headwaters. At this location (figures 19-21), flowing water is perennial and a functional riparian community exists. Peterson Draw Reservoir #1 is located approximately 200 yards up stream of the above cross section location. No maintenance on the reservoir has occurred since its initial construction. Due to the lack of regular maintenance, reservoir #1 has trapped large amounts of sediment and needs to be cleaned in order to maintain functional water storage capacity.

A small overflow channel allows water to exit reservoir #1 and is responsible for maintaining the existing riparian community and developing new channel characteristics below county road #16. Estimated bankfull area below reservoir #1 is 1.318 ft². This estimation is probably accurate based on the muted flow regime (~less than 1 cfs) the system has experienced following construction of reservoir #1 in 1953.

Figure 22: Cross sectional profile below Peterson Draw Reservoir #2.



Peterson Draw (below reservoir #2) 10/2005

Figure 23: Looking US at cross section



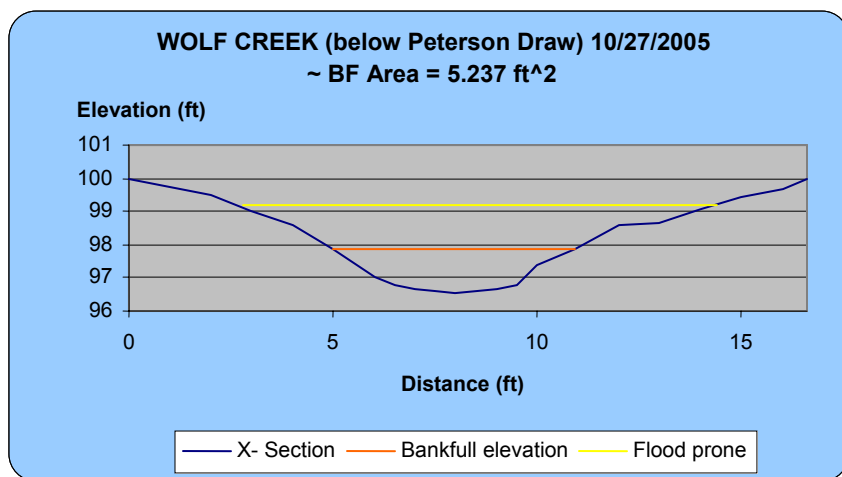
Figure 24: Looking DS at cross section



Figures 22-24 are located approximately 100 yards below Peterson Draw Reservoir #2. Note the lack of riparian vegetation and the absence of well defined channel characteristics. Bankfull area was estimated at ~ 8.78 ft² which is probably representative of historic flow regimes prior to reservoir construction in 1958. The embankment and spillway were reconstructed in May of 1992. No records of when the blowout occurred have been found. At the present time the above reservoirs contain nearly enough storage capacity to contain runoff from precipitation and snowmelt. However, the upper portion of the reservoir is trapping significant amounts of sediment and will need to be cleaned in the near future to maintain functional conditions.

Figures 25-27 are located in the main stem of Wolf Creek approximately 50 yards below the confluence with Peterson Draw. As evident in the photos, this reach lacks riparian vegetation and contains flow only in response to spring snowmelt and high intensity precipitation events. Bankfull area was estimated at 5.237 ft² which is significantly low considering the drainage area behind this point (~65,000 acres). Numerous stock ponds exist in the Wolf Creek drainage above this location (many are located on private lands in the headwaters of the catchment area).

Figure 25: Cross sectional profile of Wolf Creek below Peterson Draw.



Wolf Creek (below Peterson Draw) 10/2005

Figure 26: Looking US at cross section



Figure 27: Looking DS at cross section



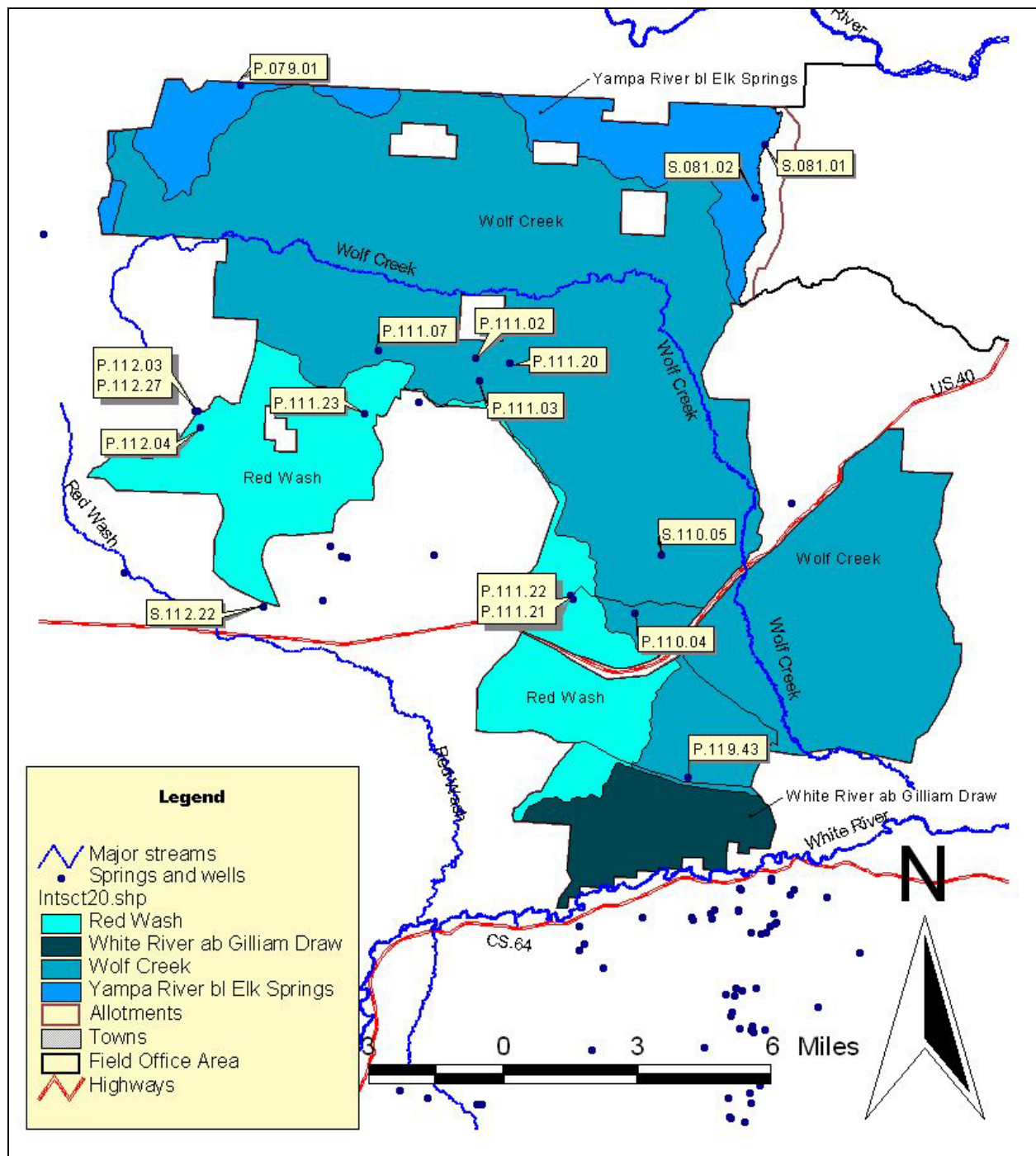
Spring monitoring data was most recently collected in 2005. However, the majority of the resource area was inventoried for springs in 1983 and 1984 which was a one of the wetter periods on record. Severe drought has impacted the study area since the late ninety's. The following table lists springs which were identified in the WRFO Water Atlas for these allotments.

BLM Spring #	Location				Water Right Filing	SC	pH	Discharge in gpm	Date Measured
	Twp	Rng	Sec#	Quarter					
79.01	6N	101W	31	NESE	AR72 ^{1/}	548	7.1	4	22-Jun-83
81.01	5N	99W	6	SWNE	Seasonal	N/A	N/A	N/A	25-Sep-84
81.02	5N	99W	7	NESW	Seasonal	N/A	N/A	N/A	25-Sep-84
110-04	3N	100W	3	SWNE	Horse Draw Well	372	7.4	14.12	28-Jun-83
110-05	4N	100W	26	SWSW	Seasonal	N/A	N/A	N/A	28-Jun-83
111-02	5N	100W	31	SENE	AR72 ^{1/}	520	6.5	1.755	10-Oct-05
111-02	---	---	---	---	---	659	7.5	2.5	29-Jun-83
111-03	5N	100W	31	SWSE	AR72 ^{1/}	520	6.5	2	10-Oct-05
111-03	---	---	---	---	---	758	7.7	2.9	30-Jun-83
111-07	5N	101W	35	SWNW	85CW554	1690	7.9	--	29-Jun-83
111-08	4N	101W	11	SESW	Seasonal	3963	7.6	2	29-Jun-83
111-20	5N	100W	32	NWSW	85CW553	817	7.6	0.39	30-Jun-83
111-21	3N	100W	4	NWNW	85CW555	452	8.2	6.45	28-Jun-83
111-22	4N	100W	33	SWSW	85CW555	408	7.9	0.66	28-Jun-83
111-23	4N	101W	15	NWNW	85CW556	6472	8	3.9	29-Jun-83
112-03	4N	102W	13	NENW	85CW481	770	7.9	7	6-Jul-83
112-04	4N	102W	13	NWSE	85CW558	5082	7.5	0.25	6-Jul-83
112.27	4N	102W	13	NENW	?	?	?	?	6-Jul-83
119-43	3N	100W	23	SESE	Seasonal	19598	8.3	0.4	31-May-84

^{1/} Water right filing is a pre 1972

Currently six of the sources do not have water rights filed on them. . Springs 81.01, 81.02, 111-08 and 119-43 are seasonal springs. Typically water rights are not granted on springs that do not maintain a perennial flow. Spring 112.27 was listed as a perennial spring in the early summer of 1983, however no water quality data was collected at that time and no water rights have been filed. Figure 28 displays spring locations within 5th field watersheds contained by the assessment area.

Figure 28: Springs and associated 5th Field Watersheds located within the assessment area.



METHODS:

This land health assessment was conducted on public lands within the Three Springs Ranch grazing allotment during the summer and fall of 2003, 2004 and 2005. The following procedures were used:

- 1) The area was first broken down in to approximately 100 different polygons. Polygons were based on soil mapping units and allotment boundaries. Polygons ranged from 2-70,000 acres.
- 2) The ID team ranged between 2-3 individuals who worked together in the field during throughout the 2005 field season. Specialists returned to the assessment area to collect additional data as time permitted.
- 3) Key areas representative if the major soils units were visited in the field by the Range Technician, and land health assessment forms were used to describe range conditions.
- 4) Stream cross sectional data was collected at representative locations within the Peterson Draw and Wolf Creek catchment areas, these locations were identified in the field by the hydrologist. All stream cross sections were mapped by a GPS unit in the field and photo points were taken and documented.
- 5) PFC assessments were conducted by the ID team in pre-determined sites based on past evaluations. All PFC evaluations were mapped by a GPS unit in the field and photo points were taken and documented.
- 6) Data from the forms was entered into a database and polygons and stop points from the maps were entered into GIS. The databases were then linked to the polygons and to the stop points to provide a system that allows maps to be made based on all of the data attributes collected.
- 7) A final determination for Standards 1 and 3 was made by the Range Technician using mean scores from each attribute on each major soil type. The Range Technician assessed representative areas as to whether they were meeting the standard, not meeting the standard, or meeting with problem areas, based on a preponderance of evidence. Reasons for the rankings were documented.
- 8) Polygon rating (meeting, not meeting, meeting with problems (Functional At Risk)) is in the process of being entered into the CARAT polygon map attribute table which also contains attribute fields to document reasons for the rating, and to lost causes. Causes for polygons not meeting or FAR for any standard were evaluated by the Range Technician and/or ID team using grazing practices, climate, soils, geology, hydrology, water rights, and riparian density and vigor as well as by evaluating the type of problem.
- 9) Numerous maps were created showing the locations of different types of problems across the assessment area, using the stop points as sample points.

10) Standard 4 was rated based on existing location data of special status species and Colorado BLM's listed species of concern together with habitat needs data and the data from the Rapid Assessment.

11) Additional data used in constructing this document was compiled by the Hydrologist from the following Environmental Assessments: Three Springs Ranch Grazing Permit Renewal (NEPA document CO11004049), Villard Ranch Grazing Permit Renewal (NEPA document CO11005006), and Box Elder Erosion Control Structures (NEPA document CO11004141)

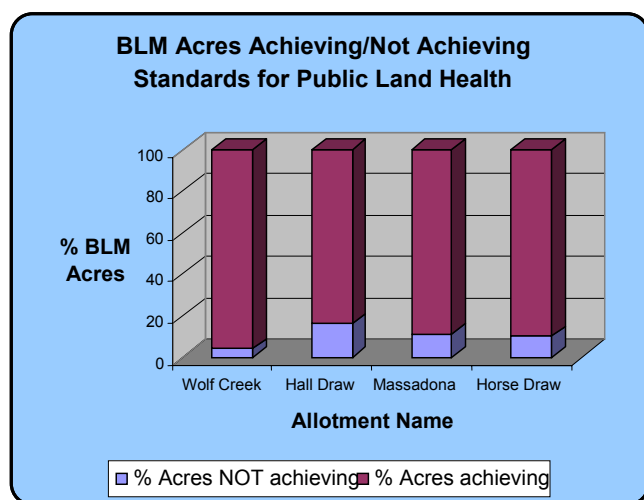
RESULTS:

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

Indicators used to assess: To assess soil health standards the following indicators were used in the Rangeland Health Evaluation Summary: occurrence of rills and degree of formation, morphologic condition of existing flow patterns, gully formation, presents of wind scoured areas, degree of litter movement and litter amount, soil surface resistance to erosion, evidence of soil surface loss (plant interspaces), plant community composition and distribution relative to infiltration and runoff, occurrence of pedestals and/or terracettes, percent bare ground, and soil compaction,

Acreage figures: The following allotments have BLM acres not achieving Standards for Public Land Health: Wolf Creek-1295 acres (4%), Hall Draw-575 acres (16%), Massadaona-720 acres (11%), and Horse Draw-1343 acres (10%) (figure 29, and Refer to the below Vegetation section of this document).

Figure 29: Public lands Achieving/Not Achieving Standards for Public Land Health by allotment



Specific Problems: A high percentage of soils encountered in this assessment are highly erosive in nature and have high salt/clay content. Active head-cutting is common within the assessment area, and soil pedestaling around vegetation root structures is widespread in the uplands.

Grazing allotments within the White River Field Office (WRFO) have been placed in one of three management categories that define the intensity of management: (1) Improve, (2) Custodial and (3) Maintain. These categories broadly define rangeland management objectives in response to an analysis of an allotment's resource characteristics, potential, opportunities, and needs.

Allotment Categorization for allotments analyzed in this watershed assessment:

- Wolf Creek – Improve
- Hall Draw – Custodial
- Horse Draw – Improve
- Massadona – Improve

Causative Factors: Negative impacts in regards to achieving rangeland health standards have occurred as a result of historic grazing practices (spring use, over utilization, etc.). Such impacts to soils include a downward change in species composition, diversity, desired plant cover, and/or reduced production for many of the rangelands, which have mostly occurred within mid seral sites and to a lesser degree within the late seral communities. With current grazing activities, the PNC communities would most likely continue to meet health standards and the early seral communities would not.

Standard 2: Riparian system associated with both running and standing water, function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100 year floods. Riparian vegetation captures sediment, and provides forage, habitat, and bio-diversity. Water quality is improved or maintained. Stable soils store and release water slowly.

Indicators used to assess: The following PFC form is an example of what indicators were used to assess riparian communities within the assessment area.

Standard Lotic Checklist
For Flowing Water

Name of Riparian-Wetland Area: Sandhill Spring-Bear Canyon-Three Springs Ranch Channel type: A

Date: 10/10/2005 Area/Segment ID: Reach 1 Length: 1 mile Location: T5N, R100W, Sec 31 SENW
UTMs: _____

ID Team Observers: Carling/Dieterich

Season of Livestock Use: 6/16-9/22

Data Collected through: X Field Visit Observations, _____ Aerial Photos or existing data, _____ Additional quantitative data collected:

Yes	No	N/A	HYDROLOGIC
X			1) Floodplain inundated in "relatively frequent" events (1-3 years)
		X	2) Active/stable beaver dams (N/A if not expected at this location)

X			3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
X			4) Riparian zone is widening OR has achieved potential extent
X			5) Upland watershed not contributing to riparian degradation
Comments: Upland watershed has been burned, grass is dominant and provides excellent ground cover.			

Yes	No	N/A	VEGETATIVE
X			6) Diverse age-class distribution (recruitment for maintenance/recovery)
X			7) Diverse composition of vegetation (for maintenance/recovery)
X			8) Species present indicate maintenance of riparian soil moisture characteristics
X			9) Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
X	X		10) Riparian plants exhibit high vigor
X			11) Adequate vegetative cover present to protect banks and dissipate energy during high flows
		X	12) Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
Comments: #10 is a “tweener” because trailing of livestock within the drainage has suppressed the riparian community.			
#11: Bedrock substrate (sand stone) is present for a significant portion of the reach which provides stability.			

Yes	No	N/A	ERIOSION DEPOSITION
X			13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody debris) adequate to dissipate energy
		X	14) Point bars are revegetating
X			15) Lateral stream movement is associated with natural sinuosity
X	X		16) System is vertically stable
X			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)
Comments: #16 is a “tweener” because below the head box the channel is incised (head cut ~1’-2’ deep).			

However, this reach is mostly stable due to bedrock substrate.

Overall Remarks

Spring is developed, trough is located in the draw and is non-functional. Fencing of the spring source will be necessary to preserve riparian community and natural channel morphology. Fencing around the head box would also be beneficial.

Summary Determination	
Functional Rating:	
Proper Functioning Condition	
Functional-at Risk	
Nonfunctional	
Unknown	

Are factors contributing to unacceptable conditions outside of the land manager's control?

Yes: No:

Trend for Functional--At Risk:	
Upward	
Downward	
Not Apparent	

Rationale for Rating:

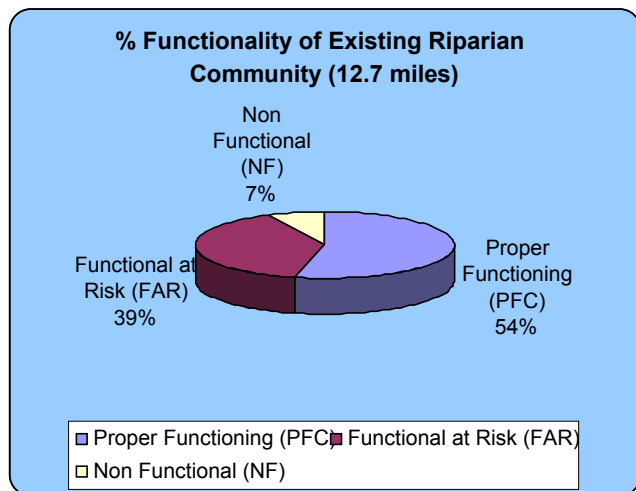
Overall this system is vertically stable, exhibits sinuosity, w/d ration, and gradient which seem to be in balance with the landscape setting, and looks to be able to handle high flows.

If yes, what are those factors?

- ☐ Flow regulations
- ☐ Mining activities
- ☐ Upstream channel conditions
- ☐ Channelization
- ☐ Road encroachment
- ☐ Oil field water discharge
- ☐ Augmented flows
- ☐ Ephemeral stream
- ☐ Other (specify) _____

Acreage figures: There are 12.7 miles of riparian systems on BLM administered lands associated with the proposed action. Of these 12.7 miles, 6.8 miles are rated as Proper Functioning Condition, 5.0 miles rated as Functional at Risk with an upward trend, and 0.9 miles (Bear Canyon) are currently not meeting standards due to small-incised headcuts (figure 30).

Figure 30: Functional condition of existing riparian communities within the assessment area.



Specific Problems:

Massadona allotment: Concerns that arose during the inventory included vehicular traffic in the riparian system as some people have bypassed a partially washed out stretch of the two-track road. Bull and musk thistles were documented above the well, and willows have been heavily hedged from wildlife and livestock use. In addition, the riparian community associated with Horse Draw well is an artificial community, as it is currently associated and obligated with human development (water well).

Horse Draw allotment: The 5-mile segment was rated as Functional at Risk with an upward trend. The rating was related to the concern of perennial pepperweed (Tall Whitetop, noxious weed), local infestations of burdock, and the ephemeral system being entrenched.

Wolf Creek allotment: The riparian community on BLM administered lands (~1 mile) is supported and obligated to upstream flowing water wells located on private land. In addition, some concern has been expressed regarding the occurrence of perennial pepperweed which is present, not dominant, within the plant community.

Causative Factors:

- 1) Perennial pepperweed infestation is related to flooding events that carry seeds from upstream sources.
- 2) Augmented flows due to the use of water rights on private lands may be detrimental to the associated riparian communities vigor and reproductive ability.
- 3) Lack of fence maintenance around spring sources and riparian areas has allowed livestock/wildlife to degrade locations.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations, and ecological processes.

Indicators used to assess: To assess the health of plant and animal communities, the following indicators were used in the Rangeland Health Evaluation Summary: appropriate abundance and distribution of big game and non-game wildlife populations, degree of litter movement and litter amount, soil surface resistance to erosion, evidence of soil surface loss (plant interspaces), plant community composition and distribution relative to infiltration and runoff, degree of compaction below soil surface (impacts to root penetration and water movement), plant functional/structural groups, plant mortality/decadence, annual production (% of potential), abundance of noxious and invasive plants, reproductive capability of perennial plants.

Acreage figures:

STANDARDS FOR PUBLIC LAND HEALTH		
Current Situation		
Standard	Acres Achieving or Moving Towards Achieving	Acres Not Achieving
#3-Plant Communities		
Wolf Ck. 06323	52955	1295
Hall Draw 06335	6402	575
Massadona 06324	7685	720
Horse Draw 06332	11223	1343
#3-Animal Communities		
Wolf Ck. 06323	52955	1295
Hall Draw 06335	6402	575
Massadona 06324	7685	720
Horse Draw 06332	11223	1343

Specific Problems: Early seral communities do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock/wildlife grazing.

The Public Land Health standard for terrestrial wildlife communities in these allotments is currently being met at the landscape scale. Although there is considerable acreage that fails to meet the standard because of the preponderance of introduced annuals in ground cover composition, there is no evidence to suggest that current grazing practices are aggravating deficiencies in the utility or available extent of wildlife habitat. Consistent with the intent of the standards, recently proposed changes livestock grazing are expected to bolster the nutritional planes and reproductive performance of local populations of big game

and nongame wildlife, and would complement continued meeting of the land health standard.

Causative Factors: The early seral communities are mostly not meeting the Standards due to the significant composition of cheatgrass, an invasive annual grass, and due to the mono-cultures in some greasewood and sagebrush communities. All other seral communities (Mid – PNC) are currently meeting standards and make up the bulk of acres on all allotments.

Historical grazing practices (spring use, over utilization, etc.) and prolong drought conditions have created the situation in which most of the early seral plant communities do not meet the rangeland health standards. The early seral sites have crossed a threshold and are nearly irreversible regardless of the livestock management without some form of disturbing activity such as fire or chemicals.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators used to assess: To assess the health of T&E plant and animal species, the following indicators were used: presence of stable and increasing populations of endemic and protected species, abundance of suitable habitat, minimal levels of undesirable or noxious plants, native plant and animal communities are distributed adequately to assure sustainability, age class diversity and to sustain recruitment and mortality fluctuations, adequate habitat connectivity, photosynthetic activity throughout growing season, community exhibits resilience to human activities, appropriate plant litter accumulations, and landscapes are composed of a variety of successional stages.

Acreage figures:

STANDARDS FOR PUBLIC LAND HEALTH		
Current Situation		
Allotment	Acres Achieving or Moving Towards Achieving	Acres Not Achieving
#4-Special Status, T&E Species		
Massadona 06324	7685	0
Horse Draw 06332	11223	0

Specific Problems: The intensity of grazing and the number of AUM's currently allowed within the study area may be adversely impacting the vigor, and reproductive ability of the T&E species debris milkvetch.

There are no specific problems associated with habitats or populations of special status animals in the project area. Public Land Health Standards for those special status species associated with white-tailed prairie dogs in the project area, including black-footed ferret, ferruginous hawk, and burrowing owl, are currently being met. There is no evidence to suggest that land use conditions or practices

are having an adverse influence on populations, available extent of suitable habitat, or the reproductive activities of these four species and are, therefore, have no adverse influence on continued meeting of the land health standard.

Greater sage-grouse habitats across the northwest quadrant of the project area generally meet the Public Land Health Standard. Normal successional processes (e.g., fire) have temporarily altered habitat utility across much of this landscape, but these changes at this scale are considered necessary and beneficial to the long term maintenance and availability of suitable habitat conditions. Livestock and big game grazing use are considered compatible with ground cover conditions acceptable for grouse brood and nest functions. The southeast quadrant of the project area represents marginal sage grouse nest and brood-rearing habitat. Recognizing the limited potential of the sites, these low-elevation saltbush communities meet the standard in this regard. Winter use is not contingent on herbaceous ground cover and big sagebrush cover is wholly adequate to meet the birds' needs at this time of year.

None of the alternatives would have any influence on continued meeting of the Public Land Health standards for bald eagle.

Causative Factors: The current grazing management of the study area has not been followed by using the alternate year method although it was part of the grazing permit conditions. This trend could have an adverse effect on the condition and function of the Debris Milkvetch through grazing during the growing season each year on the Horse Draw pasture.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and antidegradation requirements set forth under State law as found in (5CCR 1002-8), as required by Section 303(c) of the Clean Water Act.

Indicators used to assess: A review of Colorado's 1989 Nonpoint Source Assessment Report (plus updates), the 305(b) report, the 303(d) list, the White River Resource Area ROD/RMP, and the Unified Watershed Assessment was done to see if any water quality concerns had been identified.

In addition, a Range Land Health evaluation was conducted which addressed the following issues in the field: occurrence of rills and degree of formation, morphologic condition of existing flow patterns, gully formation, degree of litter movement and litter amount, soil surface resistance to erosion, evidence of soil surface loss (plant interspaces), plant community composition and distribution relative to infiltration and runoff, occurrence of pedestals and/or terracettes, percent bare ground, and soil compaction.

Furthermore, stream cross sectional data was collected at preferred locations to assess current morphologic conditions and monitor changed due to climate and land use changes (pond

construction, grazing, roads, ect...). Water quality parameters such as pH, specific conductivity (SC), and discharge (CFS) were documented in spring inventories and PFC assessments were performed which assessed the vegetal component of stream bank stability.

Acreage figures:

STANDARDS FOR PUBLIC LAND HEALTH		
Current Situation		
Allotment	Stream Miles Achieving or Moving Towards Achieving	Acres Not Achieving
#5-Water Quality (stream miles)		
Wolf Ck. 06323	27.2	0
Hall Draw 06335	12.6	0
Massadona 06324	10.2	0
Horse Draw 06332	24.2	10

Specific Problems:

- Nearly all the lower Wolf Creek watershed (south of Hwy. 40) occurs upon shale badland soils that are derived from Mancos Shale. These soils are highly erosive in nature and have extremely high salt/clay content. Sediment yield from this general area is estimated at 5 to 12 tons per acre with some areas producing as much as 20 tons per acre. The White River ROD/RMP has identified approximately 10 miles of Wolf Creek below highway 40 (Horse Draw Allotment) as not meeting Public Land Health Standard #5 for suspended sediment and salinity. Also, Red Wash and Wolf Creek are both listed on the states Monitoring and Evaluation List (M&E List) for suspended sediment and salinity.
- Without proper maintenance, existing sediment retention structures will have long term impacts detrimental to watershed health. Creating pits and gully plugs will cause a change in base level at the location which if not properly maintained will be the origin of head cut greater than or equal to the size of the original cut. This will result in accelerated erosion rates above the structure as head cut migrate to the drainage divide.
- Improper road design and inadequate road maintenance has altered natural drainage patterns and accelerated erosion rates throughout the assessment area.
- Channel morphology below sediment retention structures is developing to accommodate post construction flow levels resulting in channel characteristics misrepresentative of drainage area ("undersized channels"). "Undersized channels" will be unable to contain typical flows for the affected drainage area if structures become non-functional or are abandoned. Long term increases in sediment load to the White River will result following abandonment/non-functional sediment retention structures.
- Cattle tend to congregate near perennial water sources resulting in significant reductions in vegetal cover and increased ground disturbance due to hoof action. Reduced ground

cover in these areas leaves soils vulnerable to erosion increasing sediment loads down gradient.

- Springs inventoried in the fall of 2005 had lower flow rates (CFS) than recorded in past surveys (1983-84). In addition, many functional springs surveyed in the early eighties are non-functional at the present time.

Causative Factors: Current management of continual grazing during the growing season without any rest contributes to erosion and water quality problems. Typically, annual runoff is dynamic and dependent aspects we control, such as the amount of vegetation retained for watershed protection and vegetation density. Depleting the vegetation cover needed to protect watersheds from raindrop impact and runoff could cause long-term erosion and water quality problems for these tributaries of the White and Yampa Rivers.

Man made structures aimed at reducing sedimentation and salt levels to the White River (Kenney Reservoir in particular) have changed flow regimes in their affected catchment areas. These altered flow regimes have influenced channel morphology resulting in undersized channels. Furthermore, poor existing road conditions combined with lack of proper road design and inadequate maintenance have disrupted natural drainage patterns and increased erosion rates.

Recent drought conditions may be to blame for diminished flows in recently inventoried springs. Reduced precipitation over the drought period has limited ground water recharge. Reduced ground water recharge may have decreasing the elevation of the local ground water table.

RECOMMENDATIONS:

Standard 1:

- Implementation of the 2005 proposed grazing management plan will enhance the ability of the rangelands to meet and continue to meet Public Land Health Standards. Renewal of Three Springs Ranch's grazing permit (0501447) for a 10 year period as outlined in the Proposed Grazing Permit table below:

Proposed Grazing Permit (0501447) for Three Springs Ranch										
Allotment		Livestock		Date		% PL	BLM AUMs	Active AUMs	Susp. AUMs	Total AUMs
Name	No.	#	Kind	On	Off					
Wolf Creek	06323	800	Cattle	05/08	12/30	63%	3927	3928	399	4327
		5	Horses	06/01	08/01	14%	1			
Hall Draw	06335	210	Cattle	12/20	02/20	100%	435	435	194	629
Massadona*	06324	200	Cattle	12/20	02/07	76%	250	1140	335	1475
		800	Cattle	03/25	04/30	76%	740			
		400	Cattle	05/01	05/15	76%	150			
Horse Draw*	06332	200	Cattle	12/20	02/07	93%	306	1394	0	1394
		800	Cattle	03/25	04/30	93%	905			

Proposed Grazing Permit (0501447) for Three Springs Ranch										
Allotment		Livestock		Date		% PL	BLM AUMs	Active AUMs	Susp. AUMs	Total AUMs
Name	No.	#	Kind	On	Off					
		400	Cattle	05/01	05/15	93%	183			

*Grazing use during the spring period will be an every other year rotational system as outlined in EA document col1004049.

Standard 2:

- Continued maintenance by the BLM on Peterson Draw Reservoir #2 Fence (1112) and Divide Creek Dam Fence (1078) would help protect riparian communities by excluding cattle from these localities. However, if it is determined that riparian and/or wildlife objectives can be met without the fences, then the BLM will remove them.
- Under the proposal, a shortened season of use at a lower grazing intensity will enhance the ability of this stream stretch to have sufficient vegetative growth to provide bank stability. Therefore, the proposal will create an upward trend for the functionality of this system and all other systems in meeting standards.

Standard 3:

- Implementation of the 2005 proposed grazing management plan (see above table).
- For controlling/limiting cheatgrass populations, compliance with Standards for Public Land Health through managed grazing, aggressive rehabilitation including aerial and drill seeding with adapted species immediately following wildfire events, and aggressive revegetation of all earthen disturbances will all aid in limiting the extent of cheatgrass. To limit the spread and establishment of noxious and invasive species, all earthen disturbances must be revegetated with adapted grass species.

Standard 4:

- Reduce AUM's and limit livestock season of use within the assessment area as outlined in the 2005 proposed grazing management plan will improve the vigor and reproductive ability of T&E plant species. Increased available cover/forage will also result from implementation of the proposed grazing management plan which will benefit wildlife.

Standard 5:

- Compliance monitoring for vegetation improvement would help identify if additional actions were needed to comply with the *Clean Water Act*.
- Carryout cheatgrass treatments within the assessment area to increase rangeland productivity, stabilize soils, and reduce sedimentation to lower reaches of the affected watersheds (2007 BPS project).
- Employment of rest from grazing, pasture rotation and shortened grazing seasons would allow the vegetation condition to improve. Any improvement to vegetation cover would also help to reduce sediment transport, which is the major water quality contaminant for the watersheds of the White and Yampa Rivers.

- Spring developments must be maintained and source areas must be properly fenced to limit degradation of source area and associated riparian communities.
- Continue seeding prescribed/natural fires with a preferred seed mixture to increase forage for wildlife/livestock, improve soil stability, and reduce sediment loads to the White and Yampa Rivers.
- Continue to stabilize active head-cutting within the assessment area with vegetation treatments, pit reservoir construction (when necessary), and bank stabilization. Implementation of soil stabilization measures will reduce sedimentation to lower reaches of the watershed.
- Address drainage/sedimentation issues involving roads and apply treatments such as improved road maintenance/design, seasonal road restrictions, and road obliteration. Application of such treatments will help restore natural drainage patterns and ultimately reduce salt concentrations and sediment loads to the White River.
- Strong commitment to monitoring and long term maintenance is essential to sustain functional stock ponds and sediment retention structures and maintain current watershed health.

INTERDISCIPLINARY REVIEW:

Name	Title	Area of Responsibility
Tamara Meagley	Natural Resource Specialist	Threatened and Endangered Plant Species
Jed Carling	Rangeland Specialist	Invasive, Non-Native Species
Ed Hollowed	Biologist	Migratory Birds
Ed Hollowed	Biologist	Threatened, Endangered and Sensitive Animal Species, Wildlife
Carol Hollowed/Nate Dieterich	Planning and Environmental Coordinator/Hydrologist	Water Quality, Surface and Ground Hydrology and Water Rights
Jed Carling/Nate Dieterich	Rangeland Specialist/Hydrologist	Wetlands and Riparian Zones
Jed Carling	Rangeland Specialist	Soils
Jed Carling	Rangeland Specialist	Vegetation
Ed Hollowed	Biologist	Wildlife Terrestrial and Aquatic
Paul Daggett/Nate Dieterich	Mining Engineer/Hydrologist	Geology and Minerals
Jed Carling	Rangeland Specialist	Rangeland Management

REFERENCES:

BLM, WRFO, Environmental Assessment, CO-110-2004-049, Three Springs Ranch Grazing Permit Renewal

BLM, WRFO Environmental Assessment, CO-110-2004-141, Box Elder Erosion Control Structures

BLM, WRFO Environmental Assessment, CO-110-2005-006, Villard Ranch Grazing Permit Renewal

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Colorado Department of Health, Water Quality Control Commission, Classifications and Numeric Standards for the White and Yampa River Basins, January 2004.

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NRCS, Soil Survey of Moffat County Area, Colorado. 1984

NRCS, Soil Survey of Rio Blanco County Area, Colorado. May 1982

NAME OF PREPARER: Nate Dieterich

NAME OF ENVIRONMENTAL COORDINATOR: Caroline Hollowed

SIGNATURE OF AUTHORIZED OFFICIAL:

Therese E. Walter

DATE SIGNED:

12/16/05